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*Customized
Student Edition*

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ARITHMETIC

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BROWN
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COOKE

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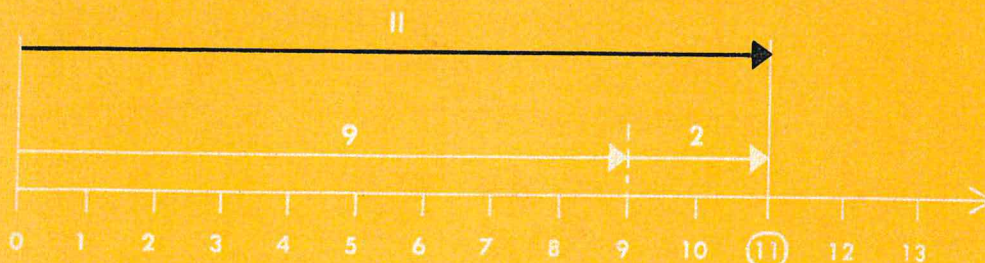
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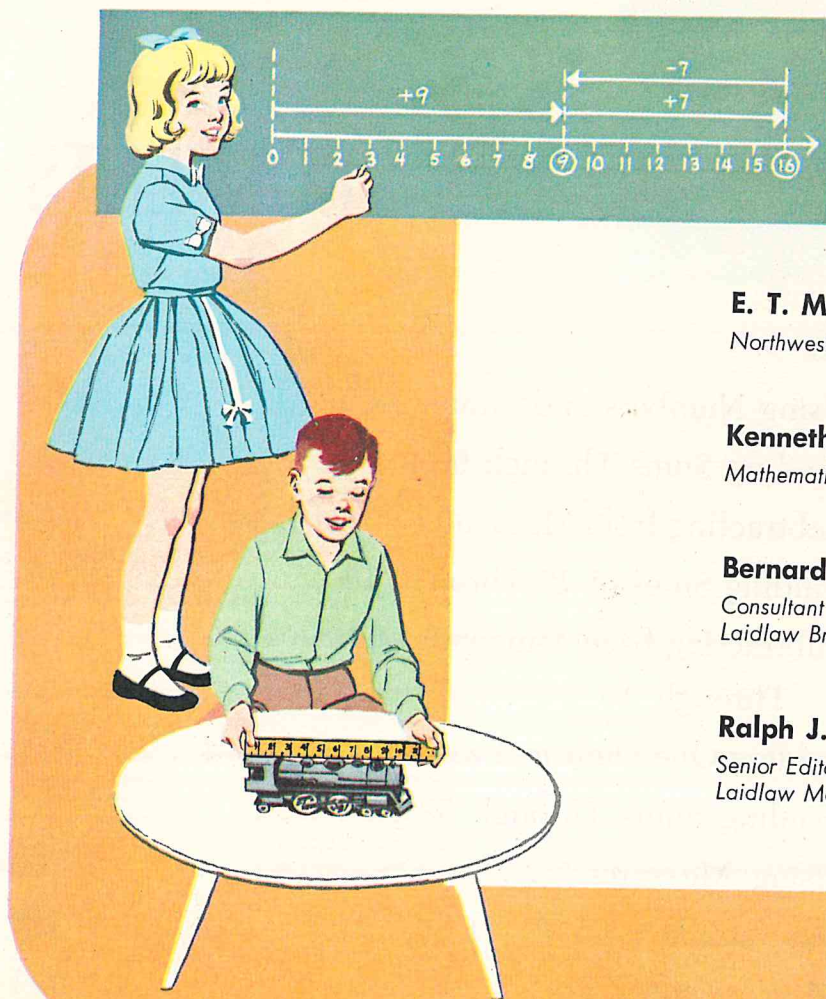


$$9 + 2 = \square$$



ARITHMETIC

3



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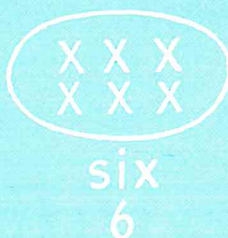
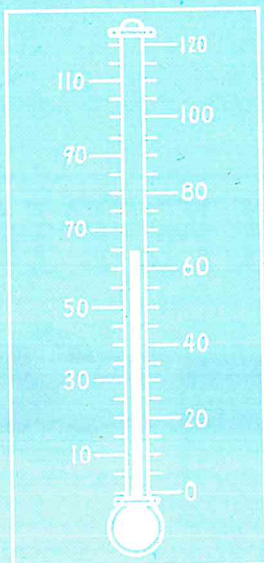
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$$4 + 1 = \square$$

$$4 + 1 = 5$$

$$\begin{array}{r} 4 \\ +1 \\ \hline 5 \end{array}$$

$$4 + 2 + 3 = \square$$

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$$4 + \square = 7$$

$$7 - 3 = \square$$

$$3 + \square = 7$$

$$\square - 4 = 3$$

$$2 + 2 + 2 = \square$$

$$3 \times 2 = \square$$

$$6 = \square \times 2$$

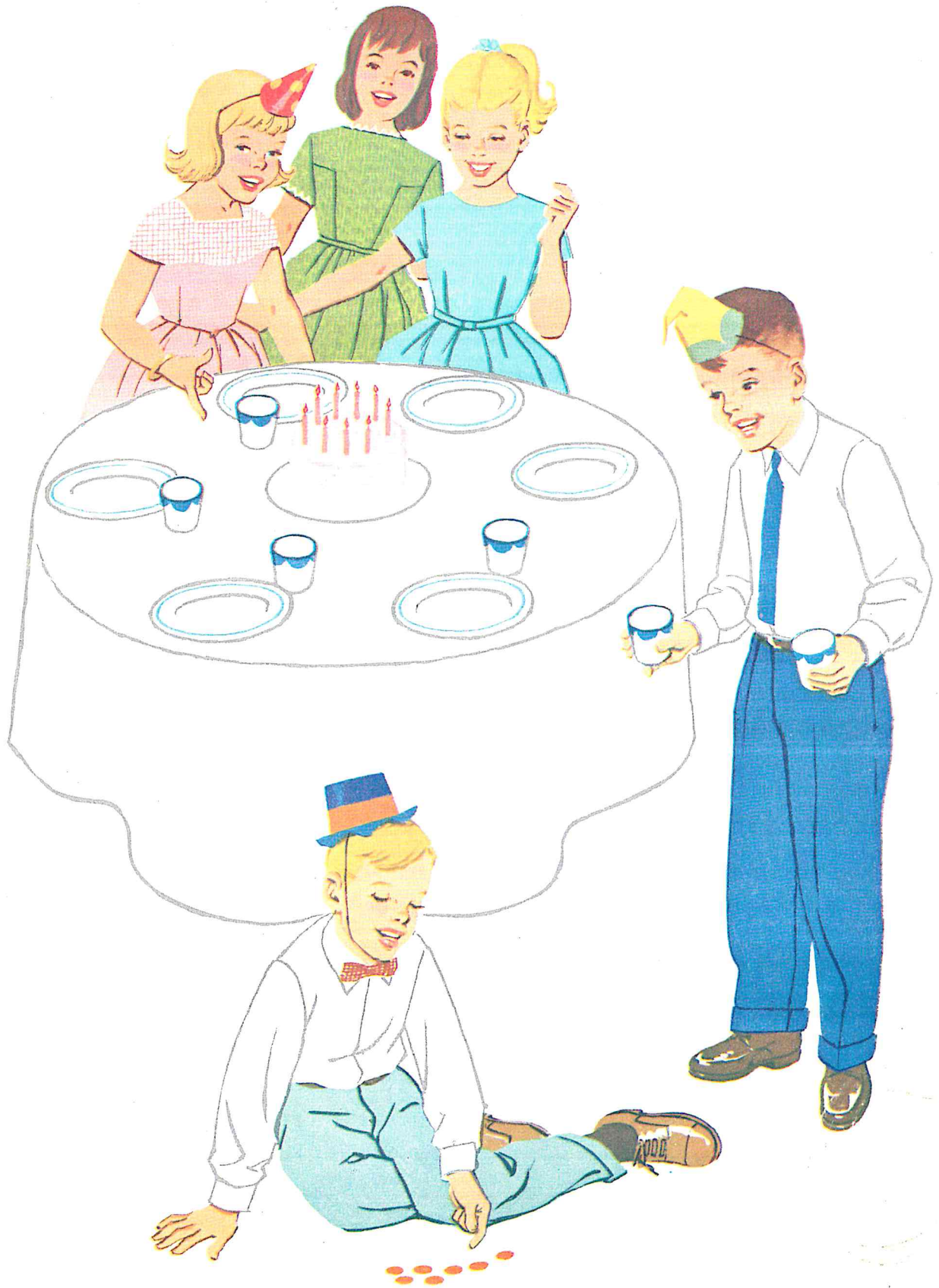
$$6 \div 2 = \square$$

$$\begin{array}{r} 2 \\ 3 \overline{)6} \end{array}$$

$$4534 - 3211 = \square$$

$$\begin{array}{r} 4534 \\ - 3211 \\ \hline 1323 \end{array}$$

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Using the Counting Numbers

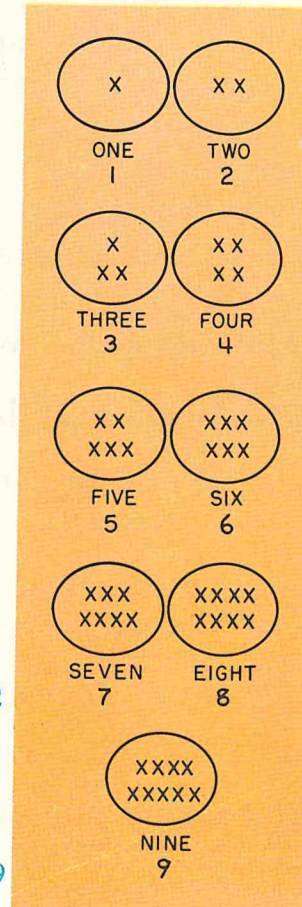
Alice wants to know how many plates are on the table. She counts the plates to find *how many*. The numbers she uses are called **counting numbers**.

Each X stands for a plate. Say the number word you see below each group, or set, of X's.

The first counting number is 1. The second counting number is 2. 1 and 1 more are 2. The third counting number is 3. 3 is 2 and 1 more. Each counting number after 1 is one more than the number just before it. 4 is 3 and how many more?

Oral Look at the picture on page 4. Answer these questions.

1. How many pennies has the boy? **7**
2. How many cups is a boy carrying? **2**
3. How many people do you see? **5**
4. How many of the people are girls? **3**
5. How many candles are on the cake? **9**



Written For each of the number words and numerals below, draw a set of X's to show the number named.

<i>a</i>	<i>b</i>	<i>c</i>	<i>d</i>	<i>e</i>	<i>f</i>	<i>g</i>
two	three	four	6	7	8	9
xx	xxx	xxxx	xxx xxx	xxxx xxx	xxxx xxxx	xxxxx xxxx
						5

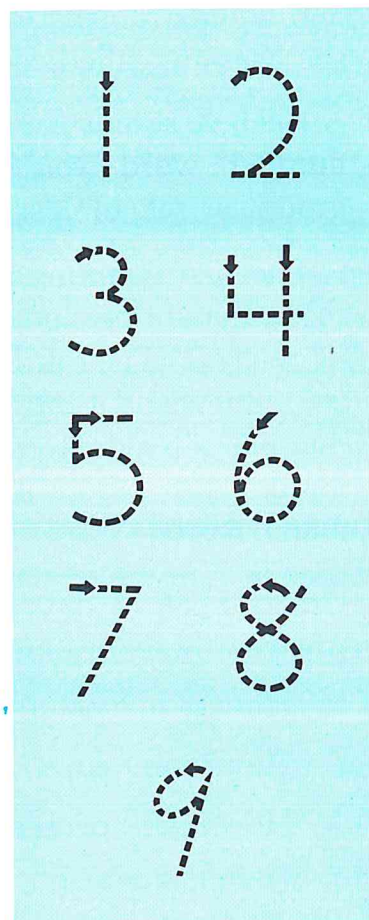
Writing the Names of Numbers

You can use the counting numbers to count any collection of people or objects. As you count, you say the number names in natural order.

You often write the number names. You can use either number words, such as one, two, three; or you can use **numerals**, such as 1, 2, 3. Each numeral should be written neatly. You may form each numeral as shown in the chart. The arrows in each numeral show how to begin it.

Oral Answer these questions.

1. Which numerals are made with straight lines? 1, 4, 7
2. Which numerals are made with one stroke? 1, 2, 3, 6, 7, 8, 9
3. Which numerals are made with two strokes? 4, 5
4. Where do you begin writing each numeral? As arrow indicates



Written Write a numeral for each of the number words below.

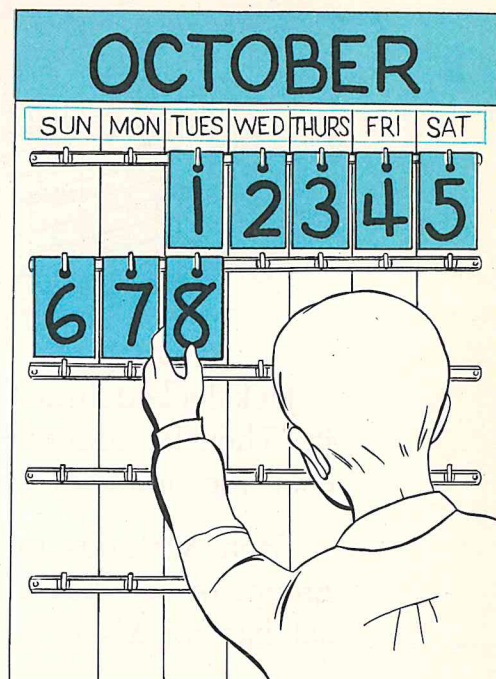
MORE PRACTICE
PAGE 301

- | <i>a</i> | <i>b</i> | <i>c</i> | <i>d</i> |
|------------|----------|----------|----------|
| 1. eight 8 | nine 9 | six 6 | seven 7 |
| 2. four 4 | five 5 | two 2 | three 3 |

Using Numbers to Tell Position

Bob's birthday is on a Tuesday. Tuesday is the **third** day of the week. His birthday comes on the **eighth** day of the month.

The days of the week have an order. Sunday is the first day, Monday is the second day. Saturday is the seventh day. The days of the month have an order too. The numeral 1 on the calendar stands for the first day. The numeral 3 stands for the third day.



Oral Read, think, and do.

1. Read these numerals: 1, 2, 3, 4, 5, 6. Which numeral is 1st? Which is 3rd? Which is 5th? **1; 3; 5**
2. Tell the order of numerals on a clock. **1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12**

Written Read, think, and do.

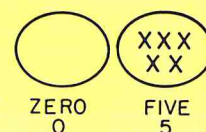
1. Write your first name. Draw a ring around the first letter of your name. **Answers will vary.**
2. Write the numerals from 1 through 9 in order across your page. Draw a ring around the 1st, the 3rd, the 5th, the 7th, and the 9th numerals. **①, 2, ③, 4, ⑤, 6, ⑦, 8, ⑨**
3. Begin with 9 and write the numerals in order for a reverse *count down* to 1. Draw a circle around the 2nd, the 4th, and the 6th numeral you wrote. **9, ⑧, 7, ⑥, 5, ④, 3, 2, 1**



Understanding Zero

Jack looked into the cage. There were no rabbits in it. Then he counted the rabbits on the lawn, using the counting numbers 1 through 5.

Each X stands for a rabbit. Which group, or set, has 5 X's in it? Which set has no X's in it?

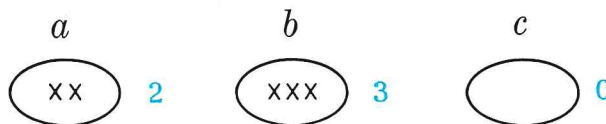


Zero is a number just like one, two, and three are numbers. Three is the number of a set with 3 objects in it. Two is the number of a set with 2 objects in it. Zero is the number of a set with no objects in it. The numeral for zero is written as shown.



Oral Answer these questions.

- How many X's are in each of the following sets?



- If Jack gave his 5 rabbits away, what numeral would show how many rabbits he had left? 0

Written Write the answer to each question above.
See above.

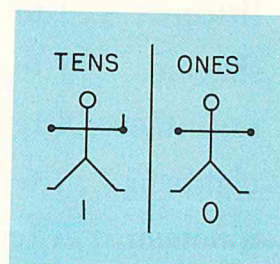
The Number 10

Amy has made a counting man to use in counting ones. A peg in either hand will stand for a one. Each hand has room enough for five ones. The two hands together have enough room for ten ones.



Amy will need another counting man if she wants to show a count beyond ten ones. This man may be called a **tens man** because he will be used to keep a record of each count of ten ones which Amy makes.

Each time all ten fingers are shown on the ones man, Amy will take the ten pegs out. She will put one peg onto the tens man to help her remember the count of ten ones. Then she can use the ones man to count ones again. The counting men show that ten ones have a value of 1 ten and no ones, or 10.



Oral Tell how you would show each of these counts on the ones counting man: three, five, eight, and nine.

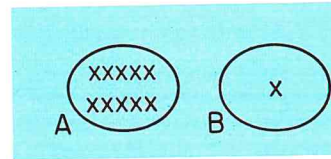
See paragraphs above.

Written Write the answer to each question.

1. In the numeral 10, which numeral, 0 or 1, shows the count of tens? **1**
2. In the numeral 10, which numeral, 0 or 1, shows the count of ones? **0**
3. Write the numerals from 1 through 10. **1, 2, 3, 4, 5, 6, 7, 8, 9, 10**

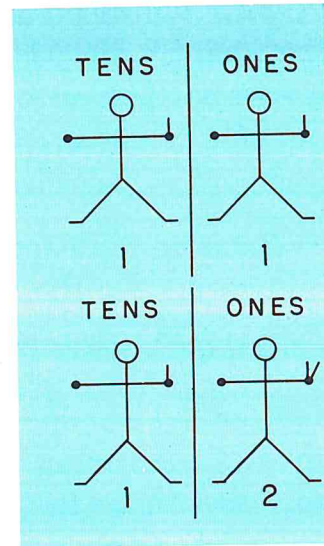
Numbers 11 Through 19

John used X's to stand for each boy he counted. Here is the picture he drew. How many X's are in A? In B?



10 boys and 1 more boy are **eleven**, or 11, boys. *Eleven* is the next counting number after ten. **Twelve** is the next counting number after eleven. *Twelve* is 1 ten and 2 ones. Other counting numbers are shown in order below:

thirteen.....1 ten and 3 ones, or 13
fourteen.....1 ten and 4 ones, or 14
fifteen.....1 ten and 5 ones, or 15
sixteen.....1 ten and 6 ones, or 16
seventeen....1 ten and 7 ones, or 17
eighteen.....1 ten and 8 ones, or 18
nineteen1 ten and 9 ones, or 19



Oral Tell how to show 11 through 19 on counting men.
 See diagrams above.

Written Write a number word for each numeral and a numeral for each number word below.

- | | <i>a</i> | <i>b</i> | <i>c</i> | <i>d</i> |
|----|--------------------|---------------------|---------------------|--------------------|
| 1. | 12 twelve | 14 fourteen | 16 sixteen | 18 eighteen |
| 2. | 13 thirteen | 15 fifteen | 17 seventeen | 19 nineteen |
| 3. | twelve 12 | sixteen 16 | eleven 11 | fourteen 14 |
| 4. | nineteen 19 | seventeen 17 | thirteen 13 | eighteen 18 |

Two-Digit Numerals

Mary counted her stamps one by one. As she looked at the last stamp she said, "Twenty." Twenty is one more than 19. It is the next counting number after nineteen. How many tens and how many ones are in A? How many tens and how many ones are in B?

A kind of table, called a **grid**, can be used with numerals to show tens and ones. The grid has a place for tens and a place for ones.

Look at the grid in C. How many ones are shown in C? How many tens are shown in C?

A	19
B	20
	TENS ONES
C	2 0

Twenty is written as 2 tens and 0 ones, or 20.

The numerals 0 through 9 are called **digits**. A numeral like 20 has 2 digits, 2 and 0. 2 is the tens digit and 0 is the ones digit.

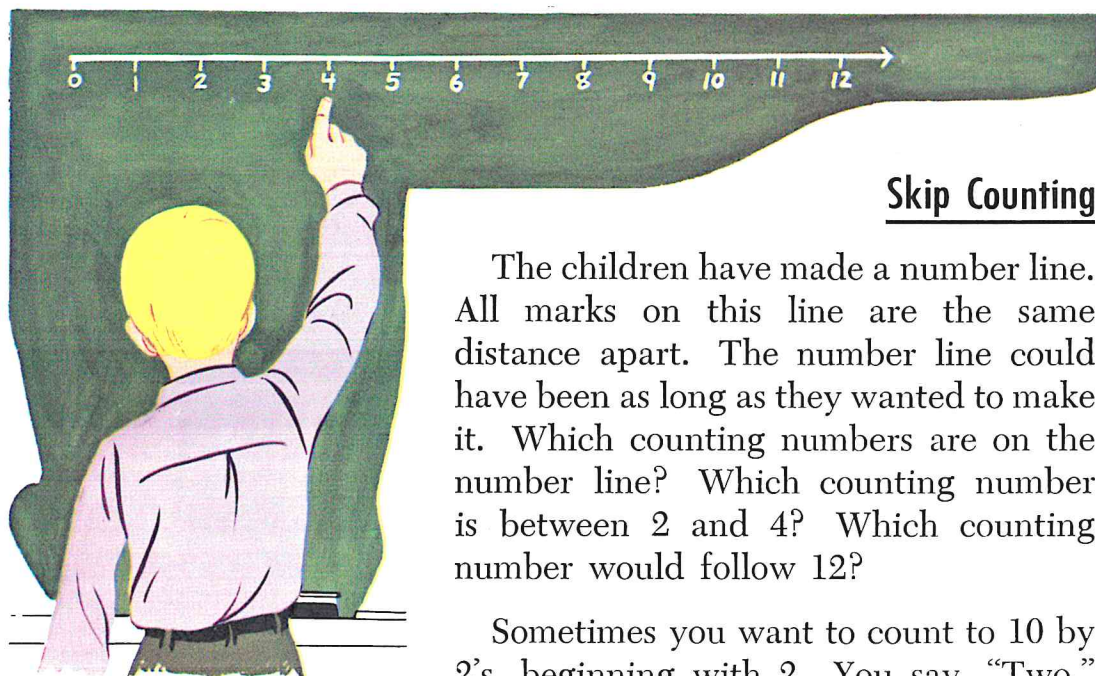
Oral Tell which digits have been used in writing these numerals: 10, 13, 15, 17, 19. 1, 0; 1, 3; 1, 5; 1, 7; 1, 9

Written Make eight grids. Write these numerals in them.

$\begin{array}{|c|c|} \hline \text{T} & \text{O} \\ \hline 1 & 0 \\ \hline \end{array}$ a
 $\begin{array}{|c|c|} \hline \text{T} & \text{O} \\ \hline 1 & 2 \\ \hline \end{array}$ b
 $\begin{array}{|c|c|} \hline \text{T} & \text{O} \\ \hline 1 & 5 \\ \hline \end{array}$ c
 $\begin{array}{|c|c|} \hline \text{T} & \text{O} \\ \hline 2 & 4 \\ \hline \end{array}$ d
 $\begin{array}{|c|c|} \hline \text{T} & \text{O} \\ \hline 2 & 7 \\ \hline \end{array}$ e
 $\begin{array}{|c|c|} \hline \text{T} & \text{O} \\ \hline 1 & 6 \\ \hline \end{array}$ f
 $\begin{array}{|c|c|} \hline \text{T} & \text{O} \\ \hline 3 & 0 \\ \hline \end{array}$ g
 $\begin{array}{|c|c|} \hline \text{T} & \text{O} \\ \hline 2 & 9 \\ \hline \end{array}$ h

Write a two-digit numeral for each number word below.

a b c d
 ten 10 twelve 12 seventeen 17 seventy 70



Skip Counting

The children have made a number line. All marks on this line are the same distance apart. The number line could have been as long as they wanted to make it. Which counting numbers are on the number line? Which counting number is between 2 and 4? Which counting number would follow 12?

Sometimes you want to count to 10 by 2's, beginning with 2. You say, "Two." You skip 3 and say, "Four." Then you say, "Six, eight, ten." You skip one number each time. You are **skip counting**.

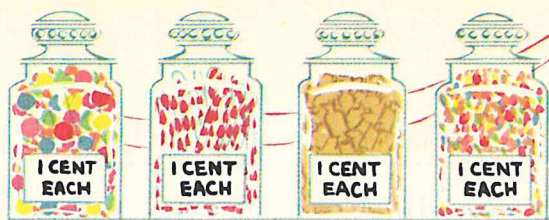
Oral Answer these questions.

1. How would you do skip counting by 2's to 20?
2, 4, 6, 8, 10, 12, 14, 16, 18, 20
2. Which numbers would you skip in doing skip counting by 3's to 12? All except 3, 6, 9, 12

Written Read, think, and do.

1. Begin with 2. Write the numerals you would use in skip counting by 2's to 20. 2, 4, 6, 8, 10, 12, 14, 16, 18, 20
2. Begin with 3. Write the numerals you would use in skip counting by 3's to 30. 3, 6, 9, 12, 15, 18, 21, 24, 27, 30

Something to do Make a long number line. Show all of the counting numbers through 30. See number line above.



Money

Tom and Jim each wanted to buy five pieces of candy. "My five pennies are just enough for five pieces of candy," said Tom.

"My nickel is just enough for five pieces too," said Jim.

A nickel and five pennies look very different, but they have the same value.

A dime is another form of money. A dime is equal in value to two nickels. It is equal in value to ten pennies.

Oral Answer these questions.

1. How much candy could Tom buy with 4 pennies?
4 pieces
2. Could Jim buy 3 pieces of candy with a nickel? *Yes*
3. When might you want 5 pennies instead of a nickel?
Answer will vary.
4. When might you want a dime instead of 10 pennies?
Answer will vary.

Written Write numerals that tell how many pieces of candy you could buy at the sale with the money below.

a

b

- | | |
|-----------------------------------|-----------------------------------|
| 1. 1 dime and 1 penny <i>11</i> | 1 dime and 5 pennies <i>15</i> |
| 2. 1 dime and 3 pennies <i>13</i> | 1 dime and 1 nickel <i>15</i> |
| 3. 1 dime and 4 pennies <i>14</i> | 2 nickels and 3 pennies <i>13</i> |



Making Changes in Form

Jane had the three coins at the left. “Mother,” she said, “do you have 2 nickels for a dime?”

“Yes,” said her mother, “give me the dime and I’ll give you the nickels.”

How many dimes will Jane have left after exchanging her 1 dime for nickels?

Oral Make believe that Jane wants to make exchanges from 1 dime and 2 nickels to other coins of the same value. Tell which numeral belongs in each blank.

1. She wants to exchange 1 dime for pennies. She will have 0 dimes, 2 nickels, and 10 pennies.
2. She wants to exchange 2 nickels for a dime. She will have 2 dimes, 0 nickels, and 0 pennies.

Written Write the numeral that belongs in each blank.

1. One dime has the same value as 2 nickels or 10 pennies.
2. Two nickels have the same value as 1 dime or 10 pennies.
3. One dime and 1 nickel have the same value as 15 pennies.
4. Two dimes have the same value as 4 nickels or 20 pennies.
5. Ten pennies and 2 nickels have the same value as 2 dimes.



Checkup Time

The numerals in () tell the pages where you can turn for help if you need it.

Important Ideas

1. The numbers 1, 2, 3, 4, 5, 6, 7, 8, and 9 are counting numbers. (5)

2. Numerals are names for numbers. (6)

3. A numeral can tell either *how many* or the position of an object in an arrangement of objects. (6, 7)

4. Zero is a number. (8)

5. Zero is the number of the empty set. It tells *not any*. (8)

6. Different forms, such as 5 cents and 1 nickel, may have the same value. (13, 14)

Words to Know

1. Counting numbers (5)

2. Numerals (6)

3. Digits (11)

4. Skip counting (12)

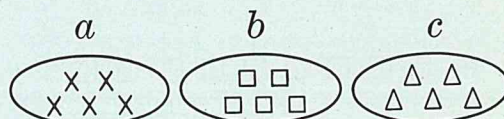
5. Value (13)

Questions to Discuss

See T15 for answers.

1. The first counting number is 1. Why is there no last counting number? (5)

2. What counting number stands for each set below? (6)



3. How would you arrange the numerals 3, 2, 5, 1, and 4 in their natural order? (6)

4. Why is it important to have the number zero? (8)

5. How can you show each of the numbers 10, 11, and 12 on counting men? (9, 10)




6. Why is ten so important in our numeration system? (9, 10, 11)

7. Which numerals are used in writing ones digits? In writing tens digits? (11)






8. How do you do skip counting to 30 by 2's? By 3's? (12)

Self-Evaluation

Part 1 Write the numeral that tells how many there are in each group, or set, below.

- 3 1. 
- 5 2. 
- 10 3. X X X X X X X X X X
- 9 4. 



Part 2 Make X's to show the number named by each numeral below.

- a b c
1. 2 xx 5  6 
2. 8  9  7 

Part 3 Write the numerals below in natural order.

1. 5, 3, 1, 4, 2, 1, 2, 3, 4, 5
2. 7, 9, 6, 8, 10, 6, 7, 8, 9, 10

Part 4 Write the missing numerals and number words.

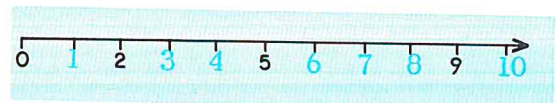
1. 1, 2, 3, 4, 5.
2. Ten, , twelve, .

Part 5 Make 4 grids as shown. Write one of these numerals on each grid.

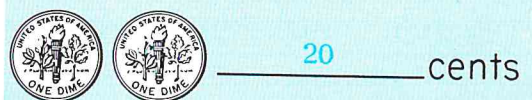
TENS	ONES

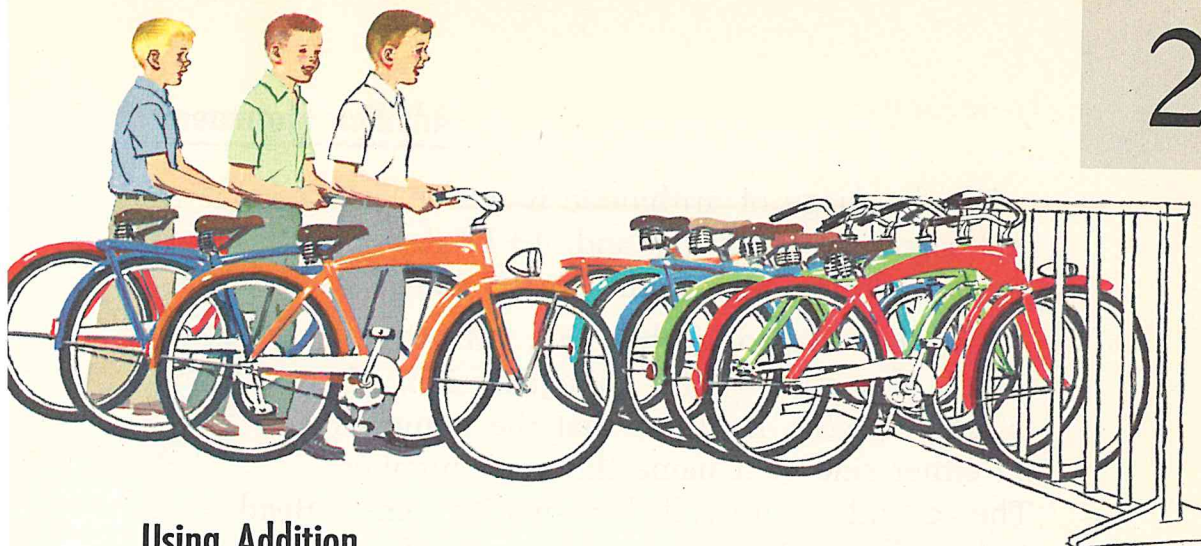
- a $10 \frac{10}{10}$ b $20 \frac{10}{20}$ c $38 \frac{10}{38}$ d $99 \frac{10}{99}$

Part 6 Write the numeral that belongs under each mark on this number line.



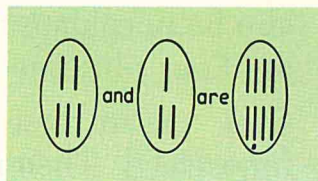
Part 7 Write the numeral that tells the value of each group, or set, of coins below.





Using Addition

The bicycle rack has places for 8 bicycles. The boys will place their bicycles in the rack. The set of 3 bicycles joined to the set of 5 bicycles will make a set of 8 bicycles.



Think of each 1 as standing for 1 bicycle. How many 1's stand for the bicycles in the rack? How many 1's stand for the bicycles which will be placed in the rack? 5 ones and 3 ones are how many ones? 3 ones and 5 ones are how many ones?

Oral Read each statement below, using a number word to replace the words *how many*.

1. 3 and 5 are *how many*? 5 and 3 are *how many*?
2. 3 and *how many* are 8? 5 and *how many* are 8?
3. *How many* and 5 are 8? *How many* and 3 are 8?

Can you do this? Make up a story problem that fits this statement: 5 and 3 are 8.

Addition Statements

The language of arithmetic is written using numerals and signs, as $4+1=\square$ and $4+1<6$. Signs used in writing addition statements are as shown.

The $+$ is called a **plus sign**. It is read *plus*. The $=$ is called an **equal sign**. It is read *equals*. It means that the numerals on either side of it name the same number. The $<$ and $>$ are called **inequality signs**. Read $<$ as *is less than*. Read $>$ as *is greater than*. A box like \square is called a **placeholder**. Read it as *how many*. Think of the box as holding a place for a numeral. Addition statements may also be in column form as shown. Read this as "Four plus one equals five."

$$\begin{array}{c} + \\ =, <, > \\ \square \end{array}$$

$$\begin{array}{r} 4 \\ +1 \\ \hline 5 \end{array}$$

Oral Read these statements. In row 2, say *how many* for each \square . Then read the statement again, replacing the \square with a number word.

a	b	c	d
1. $2+3=5$	$3+2=5$	$3+1>3$	$1+3<5$
2. $2+\overset{\text{three}}{\square}=5$	$\overset{\text{three}}{\square}+2=5$	$3+\overset{\text{one}}{\square}=4$	$\overset{\text{one}}{\square}+3=4$

Written Write each of these sentences in the language of arithmetic. The first one is done for you.

- 3 dogs and 2 dogs are how many dogs? $3+2=\square$
- 3 dogs and how many dogs are 5 dogs? $3+\square=5$
- 2 pears plus 1 pear equal how many pears? $2+1=\square$
- How many cents plus 2 cents are 4 cents? $\square+2=4$

Addition Language

The sign $+$ tells that four and three are to be added. Each number to be added is called an **addend**. The number obtained by adding is called the **sum**. 4 and 3 name addends and 7 names the sum.

Oral Tell which numbers are addends in each statement.

a
1. $5+1=6$ 5, 1


2. $2+4=6$ 2, 4

3. $3+3>5$ 3, 3

b
 $1+5=6$ 1, 5

$4+2=6$ 4, 2

$1+6<8$ 1, 6



$$\begin{array}{r} 4 \text{ addend} \\ + 3 \text{ addend} \\ \hline 7 \text{ sum} \end{array}$$

Written Write addition statements using $+$ signs, $=$ signs, and the numerals below in the given order.

a
1. 3, 6, 9 $3+6=9$

2. 1, 8, 9 $1+8=9$

3. 3, 5, 8 $3+5=8$

b
6, 3, 9 $6+3=9$

6, 2, 8 $6+2=8$

2, 4, 6 $2+4=6$

c
8, 1, 9 $8+1=9$

5, 3, 8 $5+3=8$

4, 2, 6 $4+2=6$

Use a $+$ sign, the numerals given, and a short line to show each addition as in *a* below. Does changing the order of the addends change the sum?

a
$$\begin{array}{r} 5 \\ +2 \\ \hline 7 \end{array}$$

b
$$\begin{array}{r} 2 \\ +5 \\ \hline 7 \end{array}$$

c
$$\begin{array}{r} 3 \\ +5 \\ \hline 8 \end{array}$$


d
$$\begin{array}{r} 5 \\ +3 \\ \hline 8 \end{array}$$

e
$$\begin{array}{r} 3 \\ +4 \\ \hline 7 \end{array}$$

f
$$\begin{array}{r} 4 \\ +3 \\ \hline 7 \end{array}$$

g
$$\begin{array}{r} 2 \\ +4 \\ \hline 6 \end{array}$$

h
$$\begin{array}{r} 4 \\ +2 \\ \hline 6 \end{array}$$



2	3	4	5	6	7
1+1	1+2 2+1	1+3 2+2 3+1	1+4 2+3 3+2 4+1	1+5 2+4 3+3 4+2 5+1	1+6 2+5 3+4 4+3 5+2 6+1

Sums Through 7

The chart above shows that $1+2$ and $2+1$ both equal 3. Two numbers may be added in either order to give the same sum. This property is called the *commutative property of addition*. Which pairs of numbers have a sum of 5? Of 7?

Oral Read each statement naming a number for each \square .

- | <i>a</i> | <i>b</i> | <i>c</i> | <i>d</i> |
|---|---|---|---|
| 1. $1+5=\square$ six | $5+1=\square$ six | $2+5=\square$ seven | $5+2=\square$ seven |
| 2. $1+\square=6$ five | $\square+5=6$ one | $2+\square=7$ five | $\square+2=7$ five |
| 3. $3+3=\square$ six | $3+\square=6$ three | $4+3=\square$ seven | $3+4=\square$ seven |

Written Copy. Write each sum.

- | <i>a</i> | <i>b</i> | <i>c</i> | <i>d</i> | <i>e</i> | <i>f</i> | <i>g</i> |
|---|--|--|--|--|--|--|
| 1. $\begin{array}{r} 4 \\ +1 \\ \hline 5 \end{array}$ | $\begin{array}{r} 3 \\ +1 \\ \hline 4 \end{array}$ | $\begin{array}{r} 1 \\ +2 \\ \hline 3 \end{array}$ | $\begin{array}{r} 2 \\ +2 \\ \hline 4 \end{array}$ | $\begin{array}{r} 4 \\ +3 \\ \hline 7 \end{array}$ | $\begin{array}{r} 5 \\ +1 \\ \hline 6 \end{array}$ | $\begin{array}{r} 2 \\ +4 \\ \hline 6 \end{array}$ |
| 2. $\begin{array}{r} 1 \\ +3 \\ \hline 4 \end{array}$ | $\begin{array}{r} 3 \\ +4 \\ \hline 7 \end{array}$ | $\begin{array}{r} 2 \\ +1 \\ \hline 3 \end{array}$ | $\begin{array}{r} 1 \\ +5 \\ \hline 6 \end{array}$ | $\begin{array}{r} 3 \\ +2 \\ \hline 5 \end{array}$ | $\begin{array}{r} 2 \\ +3 \\ \hline 5 \end{array}$ | $\begin{array}{r} 1 \\ +6 \\ \hline 7 \end{array}$ |
| 3. $\begin{array}{r} 2 \\ +5 \\ \hline 7 \end{array}$ | $\begin{array}{r} 3 \\ +3 \\ \hline 6 \end{array}$ | $\begin{array}{r} 4 \\ +2 \\ \hline 6 \end{array}$ | $\begin{array}{r} 5 \\ +2 \\ \hline 7 \end{array}$ | $\begin{array}{r} 6 \\ +1 \\ \hline 7 \end{array}$ | $\begin{array}{r} 1 \\ +1 \\ \hline 2 \end{array}$ | $\begin{array}{r} 1 \\ +4 \\ \hline 5 \end{array}$ |

Something to do
Make practice cards like these:

Front

3
$\begin{array}{r} 3 \\ +2 \\ \hline \end{array}$

Back

3
$\begin{array}{r} 3 \\ +2 \\ \hline 5 \end{array}$

Using an Addition Table

An addition table is very helpful in finding any sum. Your answers to the following questions will help you learn to use the table. Which numerals are across the top row? Which numerals are down the front column? Where do you find the sum of 4 and 2?

+	1	2	3	4	5	6	7	8	9
1	2	3	4	5	6	7	8	9	10
2	3	4	5	6	7	8	9	10	11
3	4	5	6	7	8	9	10	11	12
4	5	6	7	8	9	10	11	12	13
5	6	7	8	9	10	11	12	13	14
6	7	8	9	10	11	12	13	14	15
7	8	9	10	11	12	13	14	15	16
8	9	10	11	12	13	14	15	16	17
9	10	11	12	13	14	15	16	17	18

Addition Table

Oral Use the table. Find and tell each sum.

- | | | | |
|--------------------|-----------------|-----------------|-----------------|
| <i>a</i> | <i>b</i> | <i>c</i> | <i>d</i> |
| 1. $7+1=\boxed{8}$ | $1+7=\boxed{8}$ | $6+2=\boxed{8}$ | $2+6=\boxed{8}$ |
| 2. $5+3=\boxed{8}$ | $3+5=\boxed{8}$ | $8+1=\boxed{9}$ | $1+8=\boxed{9}$ |
| 3. $7+2=\boxed{9}$ | $2+7=\boxed{9}$ | $6+3=\boxed{9}$ | $3+6=\boxed{9}$ |

Written Copy. Write each sum.

- | | | | | | | | |
|---|--|--|--|--|--|--|--|
| <i>a</i> | <i>b</i> | <i>c</i> | <i>d</i> | <i>e</i> | <i>f</i> | <i>g</i> | <i>h</i> |
| 1. $\begin{array}{r} 1 \\ +5 \\ \hline 6 \end{array}$ | $\begin{array}{r} 8 \\ +1 \\ \hline 9 \end{array}$ | $\begin{array}{r} 6 \\ +3 \\ \hline 9 \end{array}$ | $\begin{array}{r} 7 \\ +2 \\ \hline 9 \end{array}$ | $\begin{array}{r} 1 \\ +4 \\ \hline 5 \end{array}$ | $\begin{array}{r} 1 \\ +8 \\ \hline 9 \end{array}$ | $\begin{array}{r} 1 \\ +1 \\ \hline 2 \end{array}$ | $\begin{array}{r} 5 \\ +4 \\ \hline 9 \end{array}$ |
| 2. $\begin{array}{r} 4 \\ +1 \\ \hline 5 \end{array}$ | $\begin{array}{r} 3 \\ +6 \\ \hline 9 \end{array}$ | $\begin{array}{r} 2 \\ +3 \\ \hline 5 \end{array}$ | $\begin{array}{r} 4 \\ +5 \\ \hline 9 \end{array}$ | $\begin{array}{r} 3 \\ +1 \\ \hline 4 \end{array}$ | $\begin{array}{r} 2 \\ +7 \\ \hline 9 \end{array}$ | $\begin{array}{r} 5 \\ +1 \\ \hline 6 \end{array}$ | $\begin{array}{r} 5 \\ +1 \\ \hline 6 \end{array}$ |
| 3. $\begin{array}{r} 7 \\ +1 \\ \hline 8 \end{array}$ | $\begin{array}{r} 5 \\ +3 \\ \hline 8 \end{array}$ | $\begin{array}{r} 6 \\ +2 \\ \hline 8 \end{array}$ | $\begin{array}{r} 4 \\ +3 \\ \hline 7 \end{array}$ | $\begin{array}{r} 1 \\ +7 \\ \hline 8 \end{array}$ | $\begin{array}{r} 4 \\ +4 \\ \hline 8 \end{array}$ | $\begin{array}{r} 3 \\ +5 \\ \hline 8 \end{array}$ | $\begin{array}{r} 3 \\ +4 \\ \hline 7 \end{array}$ |

Something to do Use squared paper. Make your own addition table with sums through 9.

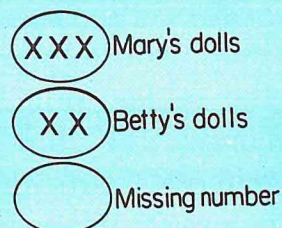
MORE PRACTICE

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Using Addition to Solve Problems

Mary has 3 dolls and Betty has 2 dolls. How many dolls do the girls have altogether?

Sally's problem is a story problem. She told a story. Then she asked a question that could be answered by doing something with the numbers in her story.



Here is her problem in pictures.

To solve any story problem, you find the missing number.

To solve Sally's problem, read it again. Pay special attention to the question. It tells you that the dolls are thought of as being put together in a single new group, or set. To solve the problem, add the number of dolls in one set to the number of dolls in the other set.

After you decide that you are to add, change the problem into the language of arithmetic, like this:

Use 3 to stand for 3 dolls.

Use 2 to stand for 2 dolls.

Use + to stand for add (since sets are put together).

Use \square to stand for the number of dolls altogether.

Write the statement, $3+2=\square$, or $3+2=5$. Answer the problem question using the sum. The girls have 5 dolls altogether.

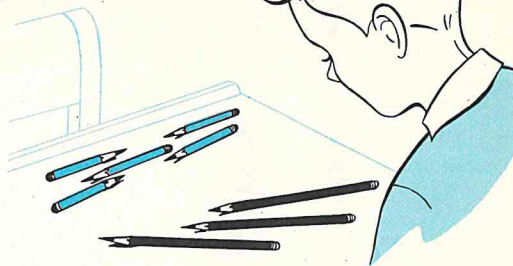
In column form, the arithmetic statement is written as at the right.

$$\begin{array}{r} 3 \\ +2 \\ \hline \end{array}$$

John has 3 long pencils and 5 short pencils. How many pencils does he have altogether?

The problem question asks you to find *how many in all*. You can answer the question either by putting the pencils together and counting them or by adding the numbers in the problem.

$$\begin{array}{r} 3 \\ +5 \\ \hline \end{array}$$

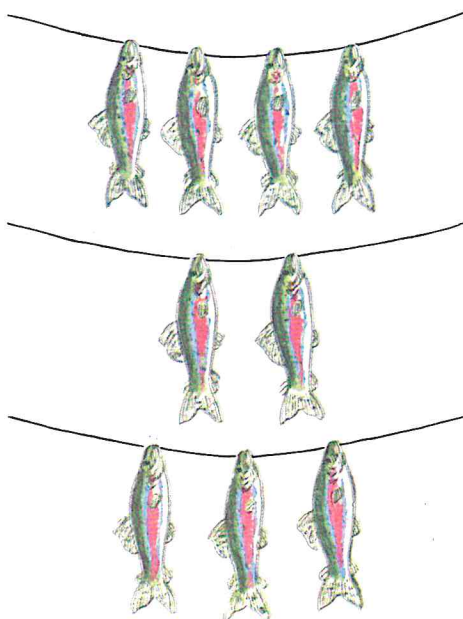


In the language of arithmetic, the problem is written $3+5=\square$. In column form, the problem is written as at the right above. How many pencils does John have? John has 8 pencils.

Oral Read each problem below. Pay special attention to the question. Tell how to solve each problem.

1. Sally gave June 4 stamps. Another friend gave her 5 stamps. How many stamps did June have in all? *Add 4 and 5.*
2. Arthur had 3 cents and Ray had 5 cents. How many cents did they have altogether? *Add 3 and 5.*
3. Roger had 6 crayons. He found 2 crayons. How many crayons did he then have? *Add 6 and 2.*
4. Sally used 2 eggs in making cookies. Her mother used 4 eggs in a cake. How many eggs did they use in all? *Add 2 and 4.*
5. Billy had 4 toy trucks and Robert had 2 toy trucks. How many toy trucks did both boys have? *Add 4 and 2.*

Written Write each problem above in the language of arithmetic and solve it. *See T23 for answers.*



Adding Three Numbers

Roy caught 4 fish, Dick caught 2 fish, and Peter caught 3 fish. How many fish did they catch altogether?

The problem can be written as $4+2+3=\square$ or in column form as shown below.

You find the sum of three numbers in two steps because you can add only two numbers at a time. One way to add is to begin at the top, add the first two

$$\begin{array}{r} 4 \\ 2 \\ +3 \\ \hline \end{array}$$

numbers, and then add their sum to the last number. Another way to add is to begin at the bottom, add the last two numbers, and then add their sum to the first number. See the example at the right.

In adding three numbers, either the first two or the last two may be grouped. This property is called the *associative property of addition*.

Begin at top

$$\begin{array}{r} 4 \longrightarrow 4 \\ 6 \longleftarrow \begin{array}{l} 4 \\ 2 \end{array} \\ 3 \longleftarrow \begin{array}{l} 2 \\ 3 \end{array} \longrightarrow 5 \\ \hline 9 \qquad \qquad 9 \qquad \qquad 9 \end{array}$$

Begin at bottom

Oral For each column addition, tell the sum.

<i>a</i>	<i>b</i>	<i>c</i>	<i>d</i>	<i>e</i>	<i>f</i>	<i>g</i>	<i>h</i>
2	1	1	1	3	1	1	2
1	1	1	1	1	2	3	1
+2	+2	+1	+3	+1	+1	+1	+1
<u>5</u>	<u>4</u>	<u>3</u>	<u>5</u>	<u>5</u>	<u>4</u>	<u>5</u>	<u>4</u>

Written Copy *a* through *h* above and write the sums.
See above.

Using Addition in Problems

To solve a story problem, you change the story problem into an arithmetic statement. Then you find the missing number. These steps will help you solve problems.

Read each problem.

Find out the story that is told.

Pay special attention to the question.

Decide what you could do with the groups, or sets, to answer the question. Add the numbers if the sets are to be put together. Then use the sum in a statement that answers the problem question.

Oral Tell what you would do with the numbers of the sets to solve each problem. *In each case numbers are added.*

1. Mary's mother gave her 3 white cards, 2 red cards, and 4 yellow cards. How many cards in all did Mary get from her mother? $3+2+4=\square$ 9 cards
2. Joe had 2 toy cars, 2 toy airplanes, and 5 toy boats. How many toys did he then have? $2+2+5=\square$ 9 toys
3. Ed had 3 green marbles, 4 red marbles, and 2 blue marbles. How many did he have altogether? $3+4+2=\square$ 9 marbles
4. Janet saw 4 birds in a tree. She saw 3 on the fence and 1 flying. How many birds did she see? $4+3+1=\square$ 8 birds
5. Marie saw 3 robins, 2 wrens, and 3 sparrows. How many birds did she see altogether? $3+2+3=\square$ 8 birds

Written Write the arithmetic statement for problems 1 through 5 above. Solve each problem. *See above.*

More Column Addition



Ann put 5 cookies on a plate, 1 cookie in her pocket, and held 1 in her hand. How many cookies did she have in all?

Answer these questions: How many sets of cookies does Ann have? How do you know that the sets of cookies are to be thought of as being put together? What do you do with the numbers when you know that sets are to be put together?

In the language of arithmetic, the problem becomes $5+1+1=\square$. You are to find the numeral that replaces the box. You may be able to *think* the number. If not, write the statement in column form. Add: $5+1=6$, $6+1=7$.

$$\begin{array}{r} 5 \\ 1 \\ +1 \\ \hline \end{array}$$

Oral Read. Tell how to solve each problem.

1. Father caught 2 fish, Jan caught 3 fish, and Bob caught 4 fish. How many fish did they catch in all?
Add 2, 3, and 4 $2+3+4=\square$ 9 fish
2. Janet had 3 red crayons, 1 green crayon, and 5 yellow crayons. How many crayons did she have altogether?
Add 3, 1, and 5 $3+1+5=\square$ 9 crayons
3. Judy's mother had 4 violet plants in one window and 2 in another. She had 2 ivy plants in still another window. How many plants did she have altogether?
Add 4, 2, and 2 $4+2+2=\square$ 8 plants

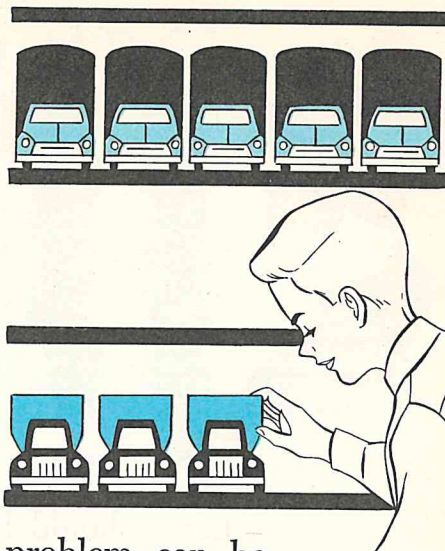
Written Write each problem in the language of arithmetic and solve it. *See above.*

Zero in Column Addition

Roger put 5 trucks on the top shelf. He left the middle shelf empty. He put 3 trucks on the bottom shelf. How many trucks did he have on all the shelves?

This story problem can be solved by adding, because the sets can be thought of as being put together.

In the language of arithmetic the problem can be written $5+0+3=\square$. The 0 names the number of the empty set. It shows *not any* trucks on the middle shelf. The statement can also be written in column form as shown. Notice that adding zero to a number does not change the number. Because of this special property, zero is called the *identity number of addition*.



$$\begin{array}{r} 5 \\ 0 \\ +3 \\ \hline 8 \end{array}$$

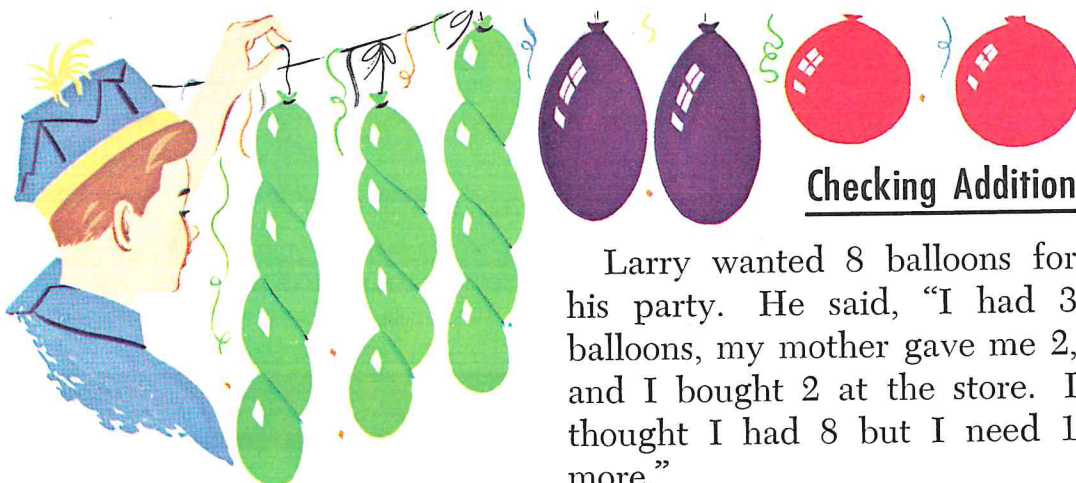
Oral Find each sum in one step.

<i>a</i>	<i>b</i>	<i>c</i>	<i>d</i>	<i>e</i>	<i>f</i>	<i>g</i>	<i>h</i>
3	2	0	3	0	6	5	3
0	4	3	0	2	0	2	0
$+5$	$+0$	$+2$	$+2$	$+6$	$+1$	$+0$	$+5$
<u>8</u>	<u>6</u>	<u>5</u>	<u>5</u>	<u>8</u>	<u>7</u>	<u>7</u>	<u>8</u>

Written Copy. Write each sum.

	<i>a</i>	<i>b</i>	<i>c</i>	<i>d</i>	<i>e</i>	<i>f</i>	<i>g</i>	<i>h</i>
1.	6	1	2	3	3	1	0	2
	3	0	2	0	0	1	3	6
	$+0$	$+5$	$+0$	$+6$	$+4$	$+0$	$+5$	$+0$
	<u>9</u>	<u>6</u>	<u>4</u>	<u>9</u>	<u>7</u>	<u>2</u>	<u>8</u>	<u>8</u>
2.	0	0	5	4	3	0	2	3
	1	2	0	5	0	2	5	0
	$+7$	$+4$	$+2$	$+0$	$+6$	$+7$	$+0$	$+4$
	<u>8</u>	<u>6</u>	<u>7</u>	<u>9</u>	<u>9</u>	<u>7</u>	<u>7</u>	<u>7</u>

MORE PRACTICE
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Larry wanted 8 balloons for his party. He said, "I had 3 balloons, my mother gave me 2, and I bought 2 at the store. I thought I had 8 but I need 1 more."

Larry should have checked his addition of 3, 2, and 2. Then he would have known how many balloons he had. He could have first added: $3+2+2$. Then he could check by adding: $2+2+3$, as shown. Larry had 7 balloons.

$$\begin{array}{r} \text{Add: } 3+2=\textcircled{5} \\ 5+2=7 \end{array}$$

$$\begin{array}{r} 3 \\ 2 \\ +2 \\ \hline 7 \end{array}$$

$$\begin{array}{r} \text{Check: } 2+2=\textcircled{4} \\ 4+3=7 \end{array}$$

Oral Tell how to find and check each sum. See diagram above.

<i>a</i>	<i>b</i>	<i>c</i>	<i>d</i>	<i>e</i>	<i>f</i>	<i>g</i>	<i>h</i>
2	5	3	0	3	4	3	4
2	0	1	1	2	1	4	2
+5	+3	+1	+7	+4	+3	+2	+0
<u>9</u>	<u>8</u>	<u>5</u>	<u>8</u>	<u>9</u>	<u>8</u>	<u>9</u>	<u>6</u>

Written Copy. Write each sum. Check.

<i>a</i>	<i>b</i>	<i>c</i>	<i>d</i>	<i>e</i>	<i>f</i>	<i>g</i>	<i>h</i>
5	6	3	5	2	4	2	1
2	2	0	0	4	4	3	2
+2	+1	+6	+1	+3	+0	+3	+3
<u>9</u>	<u>9</u>	<u>9</u>	<u>6</u>	<u>9</u>	<u>8</u>	<u>8</u>	<u>6</u>

Using Addition in Problems About Money

Bill made up this problem: Jane had 3¢. Her uncle gave her 4¢. How much money did Jane have then?

The sign ¢ is used in place of the word *cents*. In the problem you are to think of the cents as being put together, so you add the numbers. You know that $3+4=7$. You also know that the answer is written as 7 cents, or 7¢.

Oral Tell how you would find the answers to the following problems.

1. John had 2¢ in his pocket and 5¢ in his hand. How many cents did John have in all? Add 2 and 5 $2+5=\square$ 7¢
2. Roy had 8¢. While he was cleaning his room, he found 1¢. How many cents did he have then? Add 8 and 1 $8+1=\square$ 9¢
3. Judy had 4¢ in her coat pocket, 2¢ in her dress pocket, and 2¢ in her hand. How much money did Judy have in all? Add 4, 2, and 2 $4+2+2=\square$ 8¢
4. Mary spent 5¢ for a pencil, 1¢ for an eraser, and 3¢ for a cooky. How much did Mary spend altogether? Add 5, 1, and 3 $5+1+3=\square$ 9¢
5. Ray spent 3¢ for gum, 5¢ for candy, and 1¢ for an eraser. How much money did he spend altogether? Add 3, 5, and 1 $3+5+1=\square$ 9¢

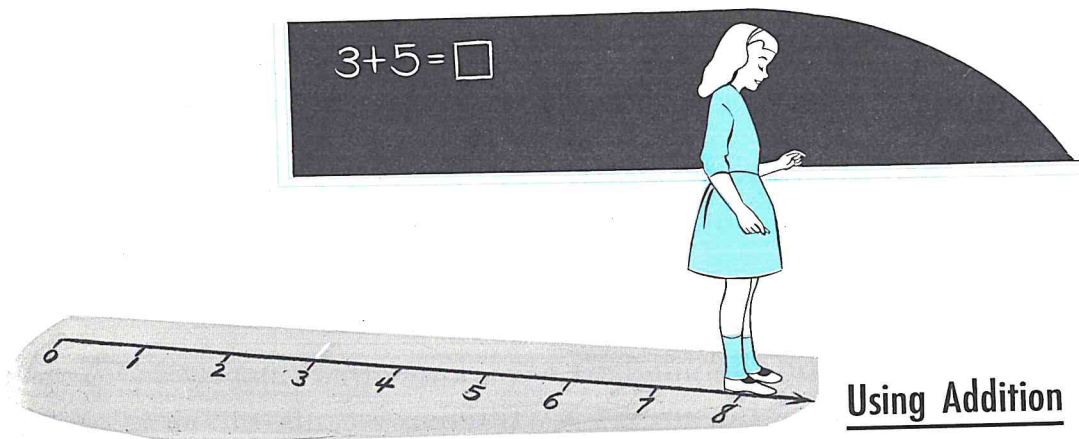
Written Solve problems 1 through 5 above. See above.

Can you do this? Make up and write your own story problems about these amounts of money.

a
5¢, 3¢, 8¢

b
4¢, 2¢, 6¢

c
1¢, 7¢, 8¢



Using Addition

To show the addition of 3 and 5, the girl walked 3 steps from 0 to 3 and stopped. Then she took 5 more steps. She stopped at 8. She had taken 8 steps in all. The sum of 3 and 5 is 8.

Oral Read each statement below. Replace each \square with a number word. Use the number line as a help.

- | | | | |
|---|--|--|--|
| <i>a</i>
1. $3 + 3 = \square$ ^{six} | <i>b</i>
$3 + \square = 6$ ^{three} | <i>c</i>
$1 + 2 = \square$ ^{three} | <i>d</i>
$1 + \square = 3$ ^{two} |
| 2. $4 + 2 = \square$ ^{six} | $2 + 4 = \square$ ^{six} | $2 + 3 = \square$ ^{five} | $3 + \square = 5$ ^{two} |
| 3. $3 + 6 = \square$ ^{nine} | $\square + 3 = 9$ ^{six} | $3 + 4 = \square$ ^{seven} | $4 + \square = 7$ ^{three} |
| 4. $2 + 1 = \square$ ^{three} | $\square + 1 = 3$ ^{two} | $2 + 2 = \square$ ^{four} | $1 + \square = 2$ ^{one} |

Written Copy. Write each sum.

- | | <i>a</i> | <i>b</i> | <i>c</i> | <i>d</i> | <i>e</i> | <i>f</i> | <i>g</i> | <i>h</i> |
|----|--|--|--|--|--|--|--|--|
| 1. | $\begin{array}{r} 1 \\ +6 \\ \hline 7 \end{array}$ | $\begin{array}{r} 5 \\ +2 \\ \hline 7 \end{array}$ | $\begin{array}{r} 6 \\ +1 \\ \hline 7 \end{array}$ | $\begin{array}{r} 2 \\ +6 \\ \hline 8 \end{array}$ | $\begin{array}{r} 3 \\ +1 \\ \hline 4 \end{array}$ | $\begin{array}{r} 6 \\ +2 \\ \hline 8 \end{array}$ | $\begin{array}{r} 1 \\ +8 \\ \hline 9 \end{array}$ | $\begin{array}{r} 1 \\ +6 \\ \hline 7 \end{array}$ |
| 2. | $\begin{array}{r} 4 \\ +4 \\ \hline 8 \end{array}$ | $\begin{array}{r} 1 \\ +3 \\ \hline 4 \end{array}$ | $\begin{array}{r} 3 \\ +5 \\ \hline 8 \end{array}$ | $\begin{array}{r} 2 \\ +5 \\ \hline 7 \end{array}$ | $\begin{array}{r} 2 \\ +7 \\ \hline 9 \end{array}$ | $\begin{array}{r} 1 \\ +4 \\ \hline 5 \end{array}$ | $\begin{array}{r} 5 \\ +3 \\ \hline 8 \end{array}$ | $\begin{array}{r} 4 \\ +5 \\ \hline 9 \end{array}$ |
| 3. | $\begin{array}{r} 1 \\ +5 \\ \hline 6 \end{array}$ | $\begin{array}{r} 5 \\ +4 \\ \hline 9 \end{array}$ | $\begin{array}{r} 8 \\ +1 \\ \hline 9 \end{array}$ | $\begin{array}{r} 4 \\ +1 \\ \hline 5 \end{array}$ | $\begin{array}{r} 3 \\ +4 \\ \hline 7 \end{array}$ | $\begin{array}{r} 1 \\ +7 \\ \hline 8 \end{array}$ | $\begin{array}{r} 5 \\ +1 \\ \hline 6 \end{array}$ | $\begin{array}{r} 7 \\ +2 \\ \hline 9 \end{array}$ |

Checkup Time

The numerals in () tell the pages where you can turn for help if you need it.

Important Ideas

1. The language of arithmetic uses numerals and signs. (18)
2. To find how many altogether, you add. (22)
3. Story problems can be written in arithmetic language. (22)
4. You can add only two numbers at a time but in any order and with any grouping of the numbers. (20, 24)
5. Adding zero to a number does not change the number. (27)

Words to Know

1. Addition (17, 18)
2. Inequality, $<$ and $>$ (18)
3. Plus, $+$ (18)
4. Equals, $=$ (18)
5. Addend (19)
6. Sum (19)
7. Cents, ϕ (29)

Questions to Discuss

See T31 for answers.

1. How can you use an addition table to find a sum? (21)
2. What do you do when you add numbers? (22)
3. How is a story problem different from an arithmetic statement? (22)
4. How do you do column addition with 3 numbers? (24)
5. Why should you check each addition? (28)

Written Practice

Write each of these problems in the language of arithmetic.

1. Jack had 3 goldfish. His father gave him 6 other goldfish. How many goldfish did Jack have altogether? (22, 23) $3+6=\square$
9 goldfish

2. Carol had 3 red crayons. Ann gave her 2 blue crayons and Mildred gave her 3 green crayons. How many crayons did she have then? (24, 25) $3+2+3=\square$
8 crayons

Self-Evaluation

Part 1 In place of these words, write the sign +, =, or \neq .

1. Plus +
2. Equal or equals =
3. Is or are =
4. And +
5. Cents \neq

Part 2 Copy. Write each sum.

	<i>a</i>	<i>b</i>	<i>c</i>	<i>d</i>
1.	$\begin{array}{r} 6 \\ +2 \\ \hline 8 \end{array}$	$\begin{array}{r} 1 \\ +6 \\ \hline 7 \end{array}$	$\begin{array}{r} 1 \\ +1 \\ \hline 2 \end{array}$	$\begin{array}{r} 2 \\ +3 \\ \hline 5 \end{array}$
2.	$\begin{array}{r} 2 \\ +7 \\ \hline 9 \end{array}$	$\begin{array}{r} 2 \\ +1 \\ \hline 3 \end{array}$	$\begin{array}{r} 1 \\ +7 \\ \hline 8 \end{array}$	$\begin{array}{r} 2 \\ +6 \\ \hline 8 \end{array}$
3.	$\begin{array}{r} 3 \\ +5 \\ \hline 8 \end{array}$	$\begin{array}{r} 3 \\ +1 \\ \hline 4 \end{array}$	$\begin{array}{r} 4 \\ +5 \\ \hline 9 \end{array}$	$\begin{array}{r} 3 \\ +4 \\ \hline 7 \end{array}$
4.	$\begin{array}{r} 2 \\ +4 \\ \hline 6 \end{array}$	$\begin{array}{r} 7 \\ +1 \\ \hline 8 \end{array}$	$\begin{array}{r} 1 \\ +2 \\ \hline 3 \end{array}$	$\begin{array}{r} 1 \\ +8 \\ \hline 9 \end{array}$
5.	$\begin{array}{r} 5 \\ +1 \\ \hline 6 \end{array}$	$\begin{array}{r} 7 \\ +2 \\ \hline 9 \end{array}$	$\begin{array}{r} 1 \\ +4 \\ \hline 5 \end{array}$	$\begin{array}{r} 1 \\ +3 \\ \hline 4 \end{array}$
6.	$\begin{array}{r} 4 \\ 3 \\ +2 \\ \hline 9 \end{array}$	$\begin{array}{r} 3 \\ 3 \\ +2 \\ \hline 8 \end{array}$	$\begin{array}{r} 5 \\ 2 \\ +2 \\ \hline 9 \end{array}$	$\begin{array}{r} 3 \\ 2 \\ +1 \\ \hline 6 \end{array}$
7.	$\begin{array}{r} 1 \\ 1 \\ +5 \\ \hline 7 \end{array}$	$\begin{array}{r} 3 \\ 0 \\ +4 \\ \hline 7 \end{array}$	$\begin{array}{r} 2 \\ 5 \\ +0 \\ \hline 7 \end{array}$	$\begin{array}{r} 0 \\ 3 \\ +6 \\ \hline 9 \end{array}$

Part 3 Write these problems in the language of arithmetic. Solve each problem.

1. 3 girls and 3 boys were reading books. How many children were reading books? $3+3=\square$
6 children

2. Roy had 5 toy cars. His aunt gave him 2 toy cars. How many toy cars did he have then? $5+2=\square$ 7 toy cars

3. Sally had 2 blue pencils and 1 green pencil in her pencil box. How many pencils did she have altogether? $2+1=\square$ 3 pencils

4. Nancy had 6 dolls. Her aunt gave her 3 dolls. How many dolls did she have then? $6+3=\square$
9 dolls

5. Jane had a penny. Her father gave her a nickel. What was the value of all of her money in pennies? $1+5=\square$ 6 pennies

6. John had 2 kittens, 4 rabbits, and 2 goldfish as pets. How many pets did he have altogether? $2+4+2=\square$ 8 pets

7. Larry had 3 plums, 2 bananas, and 4 oranges. How many pieces of fruit did he have? $3+2+4=\square$ 9 pieces



Comparing Addition and Subtraction

4 children in the picture above are waiting to get on the merry-go-round. 3 children joined by 4 children are how many children altogether?

Make believe that the merry-go-round stopped and that 4 children got off. How many would be left?

First the groups, or sets, of 4 and 3 were put together, or joined, to find how many altogether. Then the larger set of 7 was **taken apart** to find how many were left. You could also find how many left by **subtracting** the numbers in the problem.

The statements below help you compare subtraction with addition.

Begin with $\begin{matrix} X \\ XX \end{matrix}$. Join $\begin{matrix} XX \\ XX \end{matrix}$ to it. You have $\begin{matrix} XXX \\ XXXX \end{matrix}$.
$$\begin{array}{r} 3 \\ +4 \\ \hline 7 \end{array}$$

Begin with $\begin{matrix} XXX \\ XXXX \end{matrix}$. Remove $\begin{matrix} XX \\ XX \end{matrix}$ from it. You have $\begin{matrix} X \\ XX \end{matrix}$.
$$\begin{array}{r} 7 \\ -4 \\ \hline 3 \end{array}$$

Subtracting from 2, 3, 4, or 5

Bob made up this problem for the class: I had a box with 4 pencils in it. I took out 3 pencils and gave them to my friends. How many pencils did I have left?



The picture shows that 3 pencils have been removed from a box of 4 pencils and that 1 pencil is left. You could find the number of pencils left by subtracting 3 from 4.

Look at statements A, B, and C. They are subtraction statements. What sign in B takes the place of *minus* in A? What sign in B takes the place of *equals* in A? Which statement is written in column form?

A 4 minus 3 equals 1

B $4 - 3 = 1$

C
$$\begin{array}{r} 4 \\ -3 \\ \hline 1 \end{array}$$

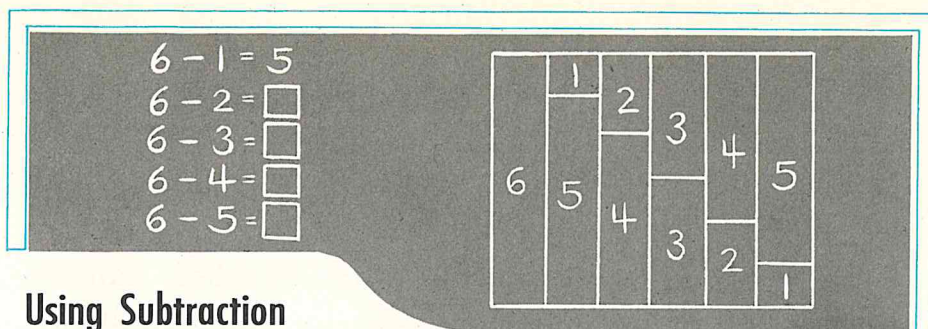
Read these subtraction statements: $5 - 1 = 4$, $5 - 4 = 1$.

Oral Read. Replace each \square with a number word.

- | | a | b | c | d |
|----|-----------------------------------|------------------------------------|-----------------------------------|----------------------------------|
| 1. | $3 + 2 = \square$ ^{five} | $5 - 2 = \square$ ^{three} | $2 + 3 = \square$ ^{five} | $5 - 3 = \square$ ^{two} |
| 2. | $4 + 1 = \square$ ^{five} | $5 - 1 = \square$ ^{four} | $1 + 4 = \square$ ^{five} | $5 - 4 = \square$ ^{one} |
| 3. | $2 + 2 = \square$ ^{four} | $4 - 2 = \square$ ^{two} | $1 + 1 = \square$ ^{two} | $2 - 1 = \square$ ^{one} |
| 4. | $3 + 1 = \square$ ^{four} | $4 - 1 = \square$ ^{three} | $1 + 3 = \square$ ^{four} | $4 - 3 = \square$ ^{one} |

Written Write each statement in rows 1 through 4 in column form, replacing the \square with the missing numeral.

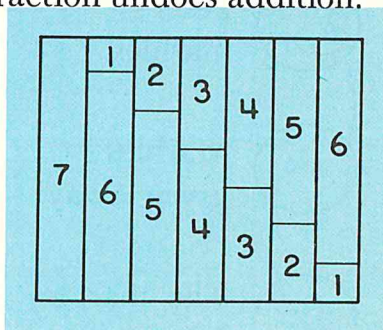
See above.



Using Subtraction

In the picture above, the strips have been put together to show sums of 6. To show how to subtract from 6, cover the top strip in any column. Then you can easily see how much is left and how subtraction undoes addition.

Look at the picture at the right. The strips show sums of 7. By using the picture, you can show how to subtract from 7. Because subtraction undoes addition, subtraction is called the *inverse operation of addition*.



Oral Read. Replace each \square with the correct number word. Use the pictures on this page for help.

- | | | | |
|--|--|--|--|
| 1. $5 + \overset{\text{one}}{\square} = 6$ | $6 - 1 = \overset{\text{five}}{\square}$ | $1 + \overset{\text{five}}{\square} = 6$ | $6 - 5 = \overset{\text{one}}{\square}$ |
| 2. $4 + \overset{\text{two}}{\square} = 6$ | $6 - 2 = \overset{\text{four}}{\square}$ | $2 + \overset{\text{four}}{\square} = 6$ | $6 - 4 = \overset{\text{two}}{\square}$ |
| 3. $6 + \overset{\text{one}}{\square} = 7$ | $7 - 1 = \overset{\text{six}}{\square}$ | $1 + \overset{\text{six}}{\square} = 7$ | $7 - 1 = \overset{\text{six}}{\square}$ |
| 4. $5 + \overset{\text{two}}{\square} = 7$ | $7 - 2 = \overset{\text{five}}{\square}$ | $2 + \overset{\text{five}}{\square} = 7$ | $7 - 2 = \overset{\text{five}}{\square}$ |
| 5. $4 + \overset{\text{three}}{\square} = 7$ | $7 - 3 = \overset{\text{four}}{\square}$ | $3 + \overset{\text{four}}{\square} = 7$ | $7 - 3 = \overset{\text{four}}{\square}$ |

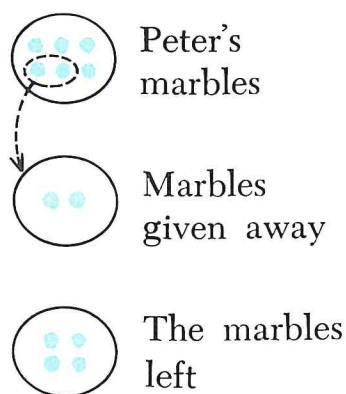
Written Write each statement in rows 1 through 5 in column form, replacing the \square with the correct numeral. See above.

Solving Subtraction Problems

Peter had 6 marbles. He gave 2 of them to a friend. How many marbles did Peter have left?

The question asked in the story problem can be answered by doing something with the numbers in the story.

Here is the story in pictures.



To solve any story problem, you find the missing number.

To solve the problem above, read it again. Pay special attention to the question. It tells you that one group, or set, of marbles is to be thought of as *taken apart*, or separated. Thus you can solve the problem by subtracting the numbers in it.

After you decide that you are to subtract, change the problem into the language of arithmetic, like this:

Use 6 to stand for 6 marbles.

Use 2 to stand for the 2 marbles given away.

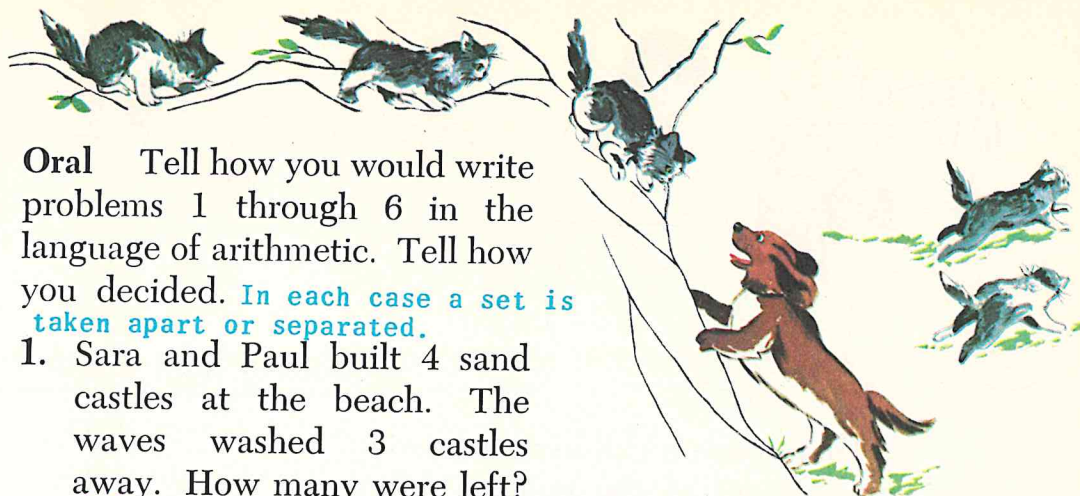
Use $-$ to stand for *take apart*, or subtract.

Use \square to stand for the number of marbles left.

Write the statement, $6 - 2 = \square$, or $6 - 2 = 4$.

In column form, the arithmetic statement is written as shown. Since $4 + 2 = 6$, you know that $6 - 2 = 4$. Peter had 4 marbles left.

$$\begin{array}{r} 6 \\ -2 \\ \hline 4 \end{array}$$



Oral Tell how you would write problems 1 through 6 in the language of arithmetic. Tell how you decided. *In each case a set is taken apart or separated.*

1. Sara and Paul built 4 sand castles at the beach. The waves washed 3 castles away. How many were left?
 $4-3=\square$ 1 castle
2. There were 7 boys in the Beaver Club. 5 of the boys went on a picnic but the others stayed at home. How many stayed home? $7-5=\square$ 2 boys
3. 6 birds made nests in our apple trees. Then 2 of the birds moved away but the others stayed. How many birds stayed in our apple tree? $6-2=\square$ 4 birds
4. We had 5 kittens on our grass. A puppy chased 3 of the kittens up a tree. How many kittens remained on the grass? $5-3=\square$ 2 kittens
5. 7 girls got on the school bus. 3 of the girls got off at Maple Street. How many girls remained on the bus?
 $7-3=\square$ 4 girls
6. 6 horses trotted up to the barn. 5 of the horses went inside. How many stayed outside? $6-5=\square$ 1 horse

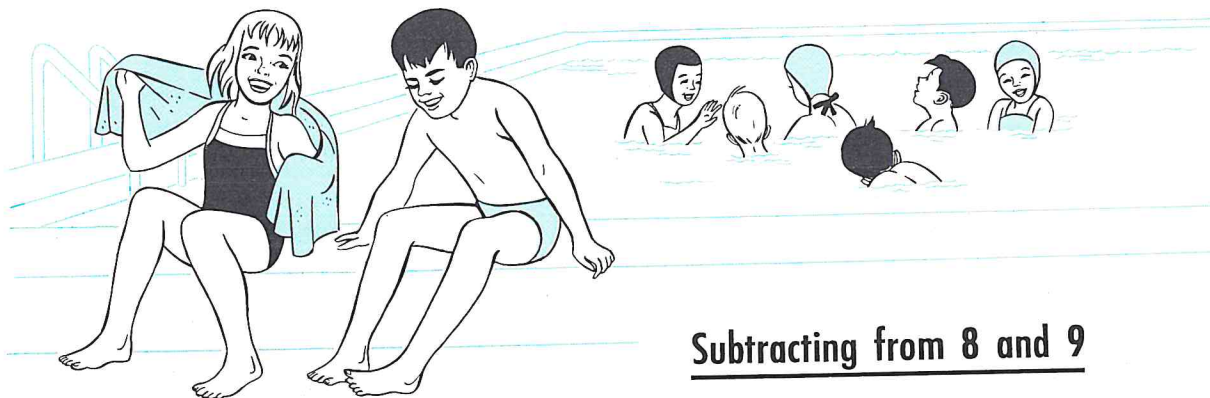
Written Solve problems 1 through 6. Use the suggestions on page 36 to help you. *See above, also T37.*

Can you do this? Make up and write story problems to fit the following statements.

$$\begin{array}{c} a \\ 7-4=\square \end{array}$$

$$\begin{array}{c} b \\ 4+\square=6 \end{array}$$

$$\begin{array}{c} c \\ \square+4=7 \end{array}$$



Subtracting from 8 and 9

There were 8 children in a swimming pool. 2 children climbed out of the pool. To find how many children were left in the pool, subtract 2 from 8.

Each subtraction has a matching addition. What numerals are used in each statement shown at the right? How does knowing an addition combination help you know a subtraction combination? Why is subtraction called the inverse operation of addition?

$$6 + 2 = 8$$

$$8 - 2 = 6$$

Oral Read. Use each addition to help you find the missing number word in the matching subtraction.

<i>a</i>	<i>b</i>	<i>c</i>	<i>d</i>
1. $8 + 1 = 9$	$9 - 1 = \square$ <i>eight</i>	$1 + 7 = 8$	$8 - \square = 1$ <i>seven</i>
2. $7 + 2 = 9$	$9 - 2 = \square$ <i>seven</i>	$2 + 6 = 8$	$8 - \square = 2$ <i>six</i>
3. $6 + 3 = 9$	$9 - 3 = \square$ <i>six</i>	$1 + 8 = 9$	$9 - \square = 1$ <i>eight</i>

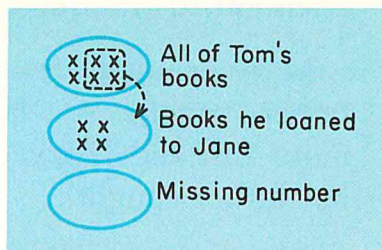
Written Copy. Write each sum or difference.

<i>a</i>	<i>b</i>	<i>c</i>	<i>d</i>	<i>e</i>	<i>f</i>	<i>g</i>	<i>h</i>
1. $\begin{array}{r} 5 \\ +4 \\ \hline 9 \end{array}$	$\begin{array}{r} 9 \\ -4 \\ \hline 5 \end{array}$	$\begin{array}{r} 4 \\ +5 \\ \hline 9 \end{array}$	$\begin{array}{r} 9 \\ -5 \\ \hline 4 \end{array}$	$\begin{array}{r} 3 \\ +6 \\ \hline 9 \end{array}$	$\begin{array}{r} 9 \\ -6 \\ \hline 3 \end{array}$	$\begin{array}{r} 2 \\ +7 \\ \hline 9 \end{array}$	$\begin{array}{r} 9 \\ -7 \\ \hline 2 \end{array}$
2. $\begin{array}{r} 7 \\ +1 \\ \hline 8 \end{array}$	$\begin{array}{r} 8 \\ -1 \\ \hline 7 \end{array}$	$\begin{array}{r} 5 \\ +3 \\ \hline 8 \end{array}$	$\begin{array}{r} 8 \\ -3 \\ \hline 5 \end{array}$	$\begin{array}{r} 4 \\ +4 \\ \hline 8 \end{array}$	$\begin{array}{r} 8 \\ -4 \\ \hline 4 \end{array}$	$\begin{array}{r} 3 \\ +5 \\ \hline 8 \end{array}$	$\begin{array}{r} 8 \\ -5 \\ \hline 3 \end{array}$

Subtraction Language

Tom has 6 books. He loaned 4 of the books to Jane. How many of the books did Tom keep?

The picture at the right illustrates the story problem. You can find the missing number by comparing the two groups, or sets. Which set is greater? By how many is it greater?



The sets of books have different numbers. If you match the sets of books one by one, you can see there are 2 books more in one set than in the other set.

The number, 2, which tells by how many one number is different from another, is called the **difference**. Just as the answer in addition is called the *sum*, the answer in subtraction is called the *difference*.

The numerals and signs at the right show $6 - 4 = 2$ in column form. Which number is the minuend? What do you subtract from the minuend? What is it called? What is the name of the number you find by subtracting the subtrahend from the minuend?

$$\begin{array}{r} 6 \text{ minuend} \\ -4 \text{ subtrahend} \\ \hline 2 \text{ difference} \end{array}$$

Oral Read. Tell each minuend and subtrahend. *The first numeral is the minuend; the second the subtrahend.*

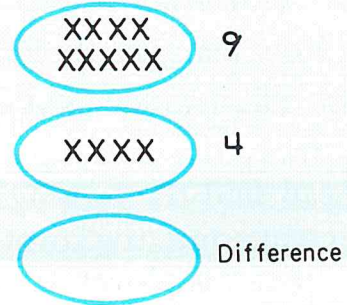
- | <i>a</i> | <i>b</i> | <i>c</i> | <i>d</i> |
|------------------------|---------------------|---------------------|---------------------|
| 1. $9 - 1 = \boxed{8}$ | $9 - 4 = \boxed{5}$ | $8 - 6 = \boxed{2}$ | $8 - 3 = \boxed{5}$ |
| 2. $7 - 3 = \boxed{4}$ | $8 - 5 = \boxed{3}$ | $6 - 4 = \boxed{2}$ | $9 - 3 = \boxed{6}$ |

Written Copy rows 1 and 2 in column form. Write each difference. *See above.*

Solving More Subtraction Problems

Read this problem. Find out what happened. Pay special attention to the question.

Mary caught 9 fish. Her father caught 4. How many more fish did Mary catch than her father caught?



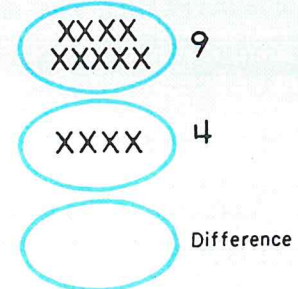
The problem tells you that one group, or set, of fish is greater than the other and that you are to find *how many greater*. To find how many greater, you could match, or compare, the fish one by one. You could also compare the numbers of the groups, or sets, to find the difference. Then you would be subtracting.

In the language of arithmetic, the problem is written $9 - 4 = \square$. In column form, the problem is written as shown. How many more fish were caught by Mary than by her father?

$$\begin{array}{r} 9 \\ -4 \\ \hline 5 \end{array}$$

Read this problem. Find out what happened. Pay special attention to the question.

Jerry has 9 marbles. Jack has 4. How many fewer marbles has Jack than Jerry? The problem tells you that one set is smaller than the other and that you are to find how many smaller. You can answer the question either by comparing the objects in the sets one by one, or by subtracting.



In the language of arithmetic, the problem can be written $9 - 4 = 5$.



Oral Tell how you would write problems 1 through 6 in the language of arithmetic. Tell how you decided.

In each case sets are compared.

1. Roy found 8 sea shells. Bob found 3. How many more shells did Roy find than Bob? $8-3=\square$



2. Joan has 8 small dolls and 3 large dolls. How many fewer large dolls than small dolls does she have? $8-3=\square$ 5 large dolls



3. If you had 7 oranges and 4 bananas, how many more oranges than bananas would you have? $7-4=\square$ 3 oranges
4. Marvin has collected 9 arrowheads. Jim has found 3. How many fewer arrowheads has Jim than Marvin? $9-3=\square$ 6 arrowheads
5. Paul has 2 sisters and 3 brothers. How many more brothers than sisters has he? $3-2=\square$ 1 brother
6. Nancy has 7 pencils and Sam has 4. How many fewer pencils has Sam than Nancy? $7-4=\square$ 3 pencils

Written As you read each problem above, draw X's to illustrate it. Then write each problem in the language of arithmetic and solve it. See above, also T41.

Can you do this? Make up and write story problems to fit these statements.

a
 $6+\square=8$

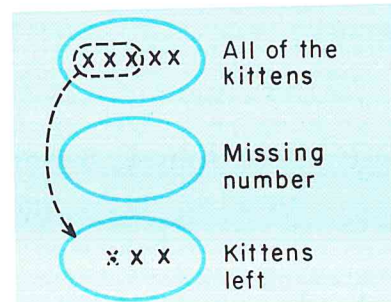
b
 $8-\square=3$

c
 $6+\square=9$

Solving Problems

Read this problem. Find out what story is told and pay special attention to the question.

Martha had 5 kittens. One morning she looked out and found only 3 of the kittens were at the door. How many of the kittens were gone?



The question tells you that one group, or set, of kittens is to be thought of as taken apart. Therefore you are to subtract.

Change the problem into the language of arithmetic, like this:

Use 5 to stand for all 5 kittens.

Use 3 to stand for the 3 kittens at the door.

Use $-$ to stand for subtract (since a set is taken apart).

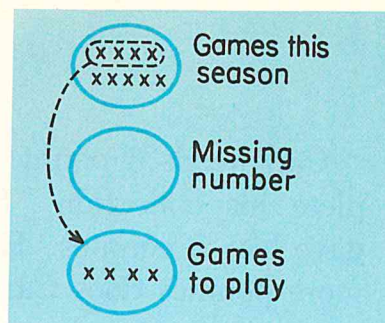
Use \square to stand for the missing number.

Write $5 - \square = 3$.

Think: You already know that $5 - 2 = 3$. The missing number is 2. 2 kittens were gone.

Another way The problem on this page tells you that one set is greater than another. You can find how many greater by subtracting the numbers to find the difference between them. Write the statement: $5 - 3 = \square$. The missing number is 2. 2 kittens were gone.

Oral Read. Tell how you would write each problem in the language of arithmetic. Tell how you decided. *In each case a set is taken apart or separated.*



1. Tom's baseball team plays 9 games this season. They have 4 more to play. How many games have they played?
 $9-4=\square$ 5 games
2. Mary sent 7 party invitations to 7 children. Five of the children answered their invitations. How many did not answer their invitations?
 $7-5=\square$ 2 children
3. Dale had 9 pennies. He bought some candy and then he had 6 pennies left. How many pennies did he spend on candy?
 $9-6=\square$ 3 pennies
4. Joe had 6 tickets for the school fair. He sold all but 2 of the tickets. How many did he sell?
 $6-2=\square$ 4 tickets
5. Sally wrote 8 arithmetic problems on her paper. She worked 4 correctly. How many were wrong?
 $8-4=\square$ 4 wrong
6. There were 5 boys in the singing group. 4 of them came to practice. How many did not come?
 $5-4=\square$ 1 boy

Written Write problems 1 through 6 in the language of arithmetic. Find the missing number in each arithmetic statement. Write it as your answer. *See above, also T43.*

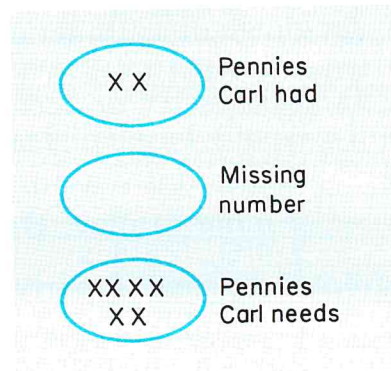
A quick review

	<i>a</i>	<i>b</i>	<i>c</i>	<i>d</i>	<i>e</i>	<i>f</i>	<i>g</i>	<i>h</i>
1.	$\begin{array}{r} 1 \\ +5 \\ \hline 6 \end{array}$	$\begin{array}{r} 8 \\ -2 \\ \hline 6 \end{array}$	$\begin{array}{r} 1 \\ +4 \\ \hline 5 \end{array}$	$\begin{array}{r} 6 \\ -5 \\ \hline 1 \end{array}$	$\begin{array}{r} 8 \\ -6 \\ \hline 2 \end{array}$	$\begin{array}{r} 1 \\ +6 \\ \hline 7 \end{array}$	$\begin{array}{r} 7 \\ -1 \\ \hline 6 \end{array}$	$\begin{array}{r} 6 \\ -2 \\ \hline 4 \end{array}$
2.	$\begin{array}{r} 5 \\ -2 \\ \hline 3 \end{array}$	$\begin{array}{r} 7 \\ -2 \\ \hline 5 \end{array}$	$\begin{array}{r} 4 \\ +1 \\ \hline 5 \end{array}$	$\begin{array}{r} 8 \\ -1 \\ \hline 7 \end{array}$	$\begin{array}{r} 2 \\ +6 \\ \hline 8 \end{array}$	$\begin{array}{r} 8 \\ -7 \\ \hline 1 \end{array}$	$\begin{array}{r} 1 \\ +2 \\ \hline 3 \end{array}$	$\begin{array}{r} 5 \\ -1 \\ \hline 4 \end{array}$

More Subtraction Problems

Carl needs 6 pennies to complete his collection. His uncle gave him 2 pennies. How many more pennies does Carl need?

The problem tells you that a missing (not named or known) number of pennies must be joined to 2 pennies to make a set of 6 pennies. The statement for the problem is $2 + \square = 6$. Because 6 is 4 more than 2, the missing number is 4. Carl needs 4 more pennies.



Another way The problem on this page tells you that one set is greater than another and that you are to find how many greater. You can find how many greater by comparing the numbers of the sets.

Change the problem into the language of arithmetic.

Use 6 to stand for the 6 pennies Carl needs.

Use 2 to stand for the pennies Carl has.

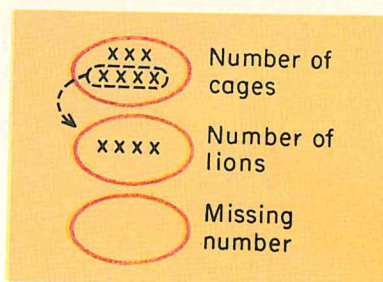
Use $-$ to stand for the idea that the numbers are to be compared to find the difference.

Use \square to stand for the missing number.

Write $6 - 2 = \square$. Is 4 the missing number?

The box should be replaced by 4 in these statements: $2 + \square = 6$ and $6 - 2 = \square$. To find the missing number in $2 + \square = 6$, you can subtract 2 from 6 because subtraction is the inverse operation of addition.

Oral Read. Tell how you would write each problem in the language of arithmetic. Tell how you decided. *In each case sets are compared.*

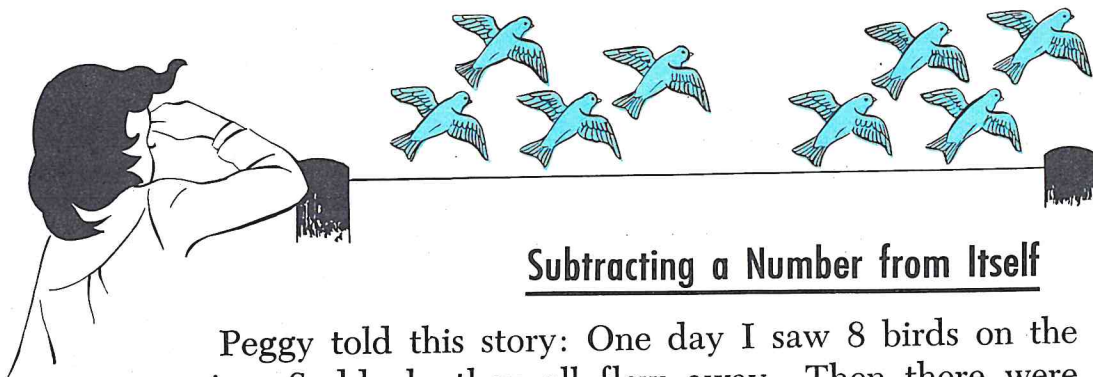


- The lion house at the zoo has cages for 7 lions. The zoo has only 4 lions. How many more lions are needed to fill the cages? $7-4=\square$
3 lions
- There were 9 chairs at the reading table. Children were sitting in 5 of the chairs. How many more children would be able to sit at the table? $9-5=\square$
4 children
- Marvin is reading a story that is 6 pages long. He has read 2 of the pages. How many more of the pages will he have to read to finish the story? $6-2=\square$
4 pages
- Peter is planting a garden. There are 8 rows in his garden. He has planted seeds in 5 rows. How many more rows must he plant? $8-5=\square$ *3 rows*
- Martha needed 5 eggs for her cake. There were only 2 eggs in the egg box. How many more eggs did Martha need? $5-2=\square$ *3 eggs*

Written Write problems 1 through 5 in the language of arithmetic. Find the missing number in each arithmetic statement. Write it as your answer. *See above, also T45.*

A quick review

	<i>a</i>	<i>b</i>	<i>c</i>	<i>d</i>	<i>e</i>	<i>f</i>	<i>g</i>	<i>h</i>
1.	$\begin{array}{r} 2 \\ +5 \\ \hline 7 \end{array}$	$\begin{array}{r} 3 \\ -1 \\ \hline 2 \end{array}$	$\begin{array}{r} 4 \\ +2 \\ \hline 6 \end{array}$	$\begin{array}{r} 9 \\ -7 \\ \hline 2 \end{array}$	$\begin{array}{r} 3 \\ +6 \\ \hline 9 \end{array}$	$\begin{array}{r} 4 \\ -3 \\ \hline 1 \end{array}$	$\begin{array}{r} 1 \\ +8 \\ \hline 9 \end{array}$	$\begin{array}{r} 6 \\ -5 \\ \hline 1 \end{array}$
2.	$\begin{array}{r} 9 \\ -8 \\ \hline 1 \end{array}$	$\begin{array}{r} 8 \\ -4 \\ \hline 4 \end{array}$	$\begin{array}{r} 2 \\ -1 \\ \hline 1 \end{array}$	$\begin{array}{r} 7 \\ -5 \\ \hline 2 \end{array}$	$\begin{array}{r} 4 \\ +4 \\ \hline 8 \end{array}$	$\begin{array}{r} 8 \\ -3 \\ \hline 5 \end{array}$	$\begin{array}{r} 3 \\ -2 \\ \hline 1 \end{array}$	$\begin{array}{r} 3 \\ +2 \\ \hline 5 \end{array}$



Subtracting a Number from Itself

Peggy told this story: One day I saw 8 birds on the wire. Suddenly they all flew away. Then there were none left.

You can write Peggy's story in the language of arithmetic as shown here: $8 - 8 = 0$. The 0 means *not any* birds left on the wire.

Read the statements below. The 0 in each one shows that there is no difference between numbers that are the same. Any number minus itself equals 0.

$1 - 1 = 0$	$2 - 2 = 0$	$5 - 5 = 0$	$6 - 6 = 0$
$3 - 3 = 0$	$4 - 4 = 0$	$7 - 7 = 0$	$9 - 9 = 0$

Oral Read. Supply each sum or difference.

	<i>a</i>	<i>b</i>	<i>c</i>	<i>d</i>	<i>e</i>	<i>f</i>	<i>g</i>	<i>h</i>
1.	$\begin{array}{r} 8 \\ +1 \\ \hline 9 \end{array}$	$\begin{array}{r} 9 \\ -9 \\ \hline 0 \end{array}$	$\begin{array}{r} 9 \\ -2 \\ \hline 7 \end{array}$	$\begin{array}{r} 7 \\ +2 \\ \hline 9 \end{array}$	$\begin{array}{r} 8 \\ -6 \\ \hline 2 \end{array}$	$\begin{array}{r} 3 \\ +5 \\ \hline 8 \end{array}$	$\begin{array}{r} 9 \\ -8 \\ \hline 1 \end{array}$	$\begin{array}{r} 9 \\ -7 \\ \hline 2 \end{array}$
2.	$\begin{array}{r} 7 \\ +2 \\ \hline 9 \end{array}$	$\begin{array}{r} 8 \\ -8 \\ \hline 0 \end{array}$	$\begin{array}{r} 6 \\ -3 \\ \hline 3 \end{array}$	$\begin{array}{r} 7 \\ -4 \\ \hline 3 \end{array}$	$\begin{array}{r} 5 \\ +3 \\ \hline 8 \end{array}$	$\begin{array}{r} 2 \\ +4 \\ \hline 6 \end{array}$	$\begin{array}{r} 6 \\ -1 \\ \hline 5 \end{array}$	$\begin{array}{r} 5 \\ -4 \\ \hline 1 \end{array}$
3.	$\begin{array}{r} 3 \\ +5 \\ \hline 8 \end{array}$	$\begin{array}{r} 4 \\ -2 \\ \hline 2 \end{array}$	$\begin{array}{r} 5 \\ -3 \\ \hline 2 \end{array}$	$\begin{array}{r} 5 \\ +2 \\ \hline 7 \end{array}$	$\begin{array}{r} 9 \\ -4 \\ \hline 5 \end{array}$	$\begin{array}{r} 2 \\ +7 \\ \hline 9 \end{array}$	$\begin{array}{r} 5 \\ -5 \\ \hline 0 \end{array}$	$\begin{array}{r} 4 \\ +5 \\ \hline 9 \end{array}$

Written Copy rows 1 through 3. Write each sum or difference. See above.

Checkup Time

The numerals in () tell the pages where you can turn for help if you need it.

Page 47—left column, top.

1. Each addition has a related subtraction (the inverse operation of addition). (33, 35, 38)

2. To find how many are left, you can subtract. (36)

3. To find the difference between two numbers, you can subtract. (39, 40)

4. Any number minus itself equals 0. (46)

Words to Know

1. Subtracting (33, 34)

2. Minus (34)

3. Column (34)

4. Row (34)

5. Minuend (39)

6. Subtrahend (39)

7. Difference (39)

Questions to Discuss

See T47 for answers.

1. What sign means *minus*? (34)

2. What subtraction fact does this addition fact help you remember? (35)

$$\begin{array}{r} 4 \\ +2 \\ \hline 6 \end{array}$$

3. Would you add or subtract to find how many are left? (36)

4. How would you find the difference between two numbers? (39)

5. In story problems how can you tell when you are to find the difference between the numbers? (39, 40, 44)

Written Practice

See also T47.

Write these problems in the language of arithmetic and solve them. (36, 40, 42)

1. Dick saw 3 white hens and 4 black hens on his visit to the farm. How many hens did he see altogether? $3+4=\square$ 7 hens

2. Paul had 3 candy bars. He gave 1 to John. How many candy bars did Paul have left? $3-1=\square$ 2 candy bars

Self-Evaluation

Part 1 Copy. Write each sum or difference. Watch the signs.

	<i>a</i>	<i>b</i>	<i>c</i>	<i>d</i>
1.	$\begin{array}{r} 2 \\ -2 \\ \hline 0 \end{array}$	$\begin{array}{r} 1 \\ +5 \\ \hline 6 \end{array}$	$\begin{array}{r} 8 \\ -2 \\ \hline 6 \end{array}$	$\begin{array}{r} 1 \\ -1 \\ \hline 0 \end{array}$
2.	$\begin{array}{r} 5 \\ +4 \\ \hline 9 \end{array}$	$\begin{array}{r} 8 \\ -6 \\ \hline 2 \end{array}$	$\begin{array}{r} 1 \\ +6 \\ \hline 7 \end{array}$	$\begin{array}{r} 7 \\ -1 \\ \hline 6 \end{array}$
3.	$\begin{array}{r} 8 \\ -5 \\ \hline 3 \end{array}$	$\begin{array}{r} 5 \\ -2 \\ \hline 3 \end{array}$	$\begin{array}{r} 7 \\ -2 \\ \hline 5 \end{array}$	$\begin{array}{r} 4 \\ +1 \\ \hline 5 \end{array}$
4.	$\begin{array}{r} 8 \\ -1 \\ \hline 7 \end{array}$	$\begin{array}{r} 2 \\ +6 \\ \hline 8 \end{array}$	$\begin{array}{r} 8 \\ -8 \\ \hline 0 \end{array}$	$\begin{array}{r} 5 \\ -1 \\ \hline 4 \end{array}$
5.	$\begin{array}{r} 9 \\ -3 \\ \hline 6 \end{array}$	$\begin{array}{r} 2 \\ +4 \\ \hline 6 \end{array}$	$\begin{array}{r} 6 \\ -3 \\ \hline 3 \end{array}$	$\begin{array}{r} 7 \\ -4 \\ \hline 3 \end{array}$
6.	$\begin{array}{r} 3 \\ 1 \\ +4 \\ \hline 8 \end{array}$	$\begin{array}{r} 3 \\ 2 \\ +1 \\ \hline 6 \end{array}$	$\begin{array}{r} 6 \\ 2 \\ +1 \\ \hline 9 \end{array}$	$\begin{array}{r} 3 \\ 0 \\ +4 \\ \hline 7 \end{array}$

Part 2 Copy. Replace each \square with the missing numeral.

	<i>a</i>	<i>b</i>
1.	$6+3=\square$	$\square+3=9$
2.	$6+\square=9$	$9-5=\square$
3.	$9-\square=4$	$\square-5=4$
4.	$7+2=\square$	$\square+2=9$
5.	$7+\square=9$	$5+\square=7$
6.	$\square+5=7$	$\square+3=8$

Part 3 Solve problems 1 through 7 below.

1. Peter had 3 toy boats. John gave him 1 more. How many toy boats did Peter have altogether? $3+1=\square$ 4 toy boats

2. Jane had 7 dolls. She gave 2 dolls to Mary. How many dolls did she have left? $7-2=\square$ 5 dolls

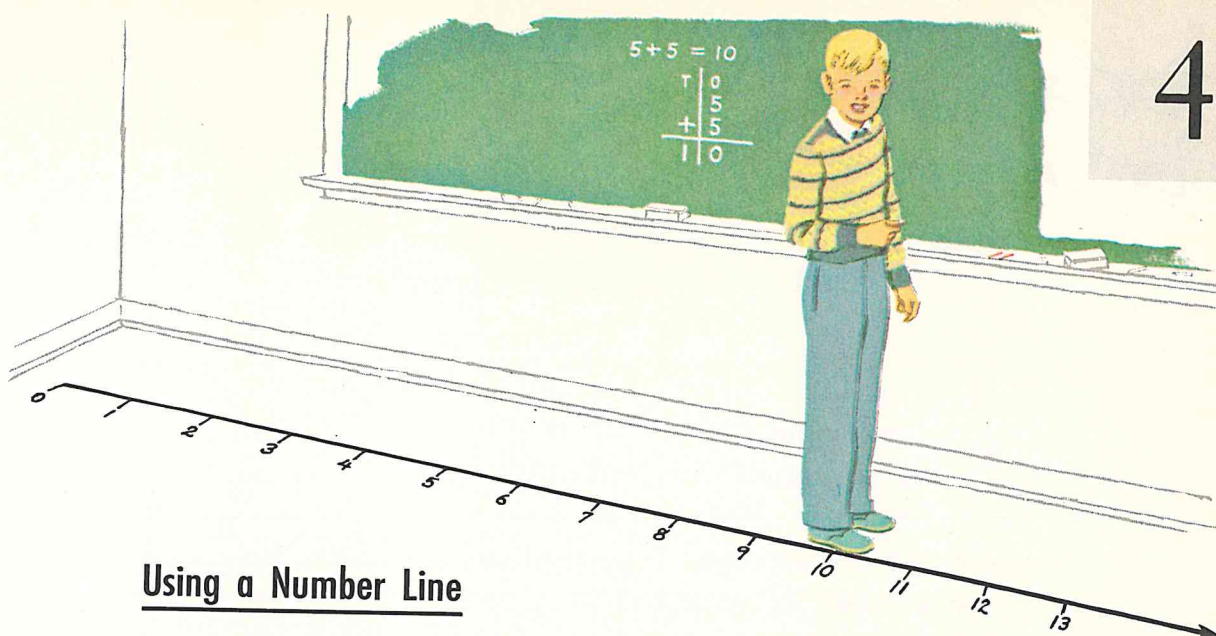
3. Ted needed 9 cents to buy a box of crayons. He had 4 cents in his pocket. How many more cents did Ted need? $9-4=\square$ 5 cents

4. Bill had 2 bananas, 3 pears, and 1 apple. How many pieces of fruit did he have altogether? $2+3+1=\square$ 6 pieces of fruit

5. Sally had 4 pieces of candy. Jean had 3 pieces of candy. How many fewer pieces of candy did Jean have than Sally? $4-3=\square$ 1 piece of candy

6. Paul had 6 marbles. John had 2. How many more marbles did Paul have than John? $6-2=\square$ 4 marbles

7. Milly had 2 jump ropes. She received 3 more for her birthday. How many jump ropes did she have altogether? $2+3=\square$ 5 jump ropes



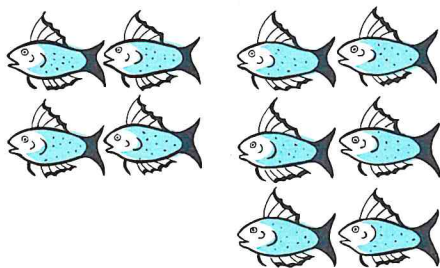
Using a Number Line

To show the addition of 5 and 5, Bob walked along the number line. He began at zero and took five short steps. Each step took him from one mark to the next mark on the number line. He stopped at 5. Then he took 5 more steps in the same direction and stopped at 10. 5 steps and 5 steps are 10 steps. $5 + 5 = 10$.

Oral Read. Replace each \square with the correct number word. Use the number line for help.

- | <i>a</i> <i>ten</i> | <i>b</i> <i>one</i> | <i>c</i> <i>ten</i> | <i>d</i> <i>nine</i> |
|-------------------------|---------------------|----------------------|----------------------|
| 1. $9 + 1 = \square 10$ | $9 + \square = 10$ | $1 + 9 = \square 10$ | $1 + \square = 10$ |
| 2. $8 + 2 = \square 10$ | $8 + \square = 10$ | $2 + 8 = \square 10$ | $2 + \square = 10$ |
| 3. $7 + 3 = \square 10$ | $7 + \square = 10$ | $3 + 7 = \square 10$ | $3 + \square = 10$ |
| 4. $6 + 4 = \square 10$ | $6 + \square = 10$ | $4 + 6 = \square 10$ | $4 + \square = 10$ |
| 5. $5 + 5 = \square 10$ | $5 + \square = 10$ | $4 + 5 = \square 9$ | $4 + \square = 9$ |

Written Write each statement in rows 1 through 5 above, replacing each \square with the correct numeral.
See above.



Sums of 10

Andy caught 4 fish and Arthur caught 6 fish. How many fish did the boys catch together?

You could answer the question in the problem by thinking of the fish as being put together and counted. You could also add as in A or B. On the grids, τ stands for tens and o stands for ones. The sum of 4 ones and 6 ones is 10 ones. The form of 10 ones must be changed to 1 ten and 0 ones. The sum is 10.

A	$\begin{array}{r} \tau \quad o \\ 4 \\ +6 \\ \hline 1\tau \quad 0 \end{array}$	B	$\begin{array}{r} \tau \quad o \\ 6 \\ +4 \\ \hline 1\tau \quad 0 \end{array}$
---	--	---	--

Additions with a sum of 10 are shown below. Is the commutative property of addition shown below? How?

$\begin{array}{r} 1 \quad 9 \\ +9 \quad +1 \\ \hline 10 \quad 10 \end{array}$	$\begin{array}{r} 2 \quad 8 \\ +8 \quad +2 \\ \hline 10 \quad 10 \end{array}$	$\begin{array}{r} 3 \quad 7 \\ +7 \quad +3 \\ \hline 10 \quad 10 \end{array}$	$\begin{array}{r} 4 \quad 6 \\ +6 \quad +4 \\ \hline 10 \quad 10 \end{array}$	$\begin{array}{r} 5 \\ +5 \\ \hline 10 \end{array}$
---	---	---	---	---

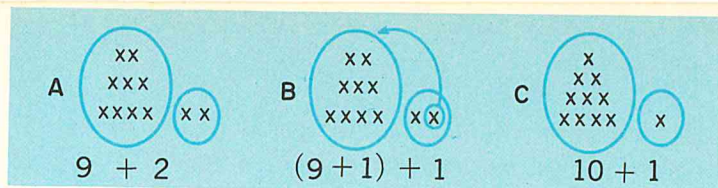
Oral Be ready to tell the sum in each addition below.

	a	b	c	d	e	f	g	h
1.	$\begin{array}{r} 6 \\ +3 \\ \hline 9 \end{array}$	$\begin{array}{r} 3 \\ +6 \\ \hline 9 \end{array}$	$\begin{array}{r} 7 \\ +3 \\ \hline 10 \end{array}$	$\begin{array}{r} 3 \\ +7 \\ \hline 10 \end{array}$	$\begin{array}{r} 4 \\ +5 \\ \hline 9 \end{array}$	$\begin{array}{r} 5 \\ +4 \\ \hline 9 \end{array}$	$\begin{array}{r} 8 \\ +2 \\ \hline 10 \end{array}$	$\begin{array}{r} 2 \\ +8 \\ \hline 10 \end{array}$
2.	$\begin{array}{r} 2 \\ +7 \\ \hline 9 \end{array}$	$\begin{array}{r} 7 \\ +2 \\ \hline 9 \end{array}$	$\begin{array}{r} 4 \\ +6 \\ \hline 10 \end{array}$	$\begin{array}{r} 6 \\ +4 \\ \hline 10 \end{array}$	$\begin{array}{r} 5 \\ +5 \\ \hline 10 \end{array}$	$\begin{array}{r} 3 \\ +4 \\ \hline 7 \end{array}$	$\begin{array}{r} 4 \\ +3 \\ \hline 7 \end{array}$	$\begin{array}{r} 5 \\ +2 \\ \hline 7 \end{array}$
3.	$\begin{array}{r} 1 \\ +8 \\ \hline 9 \end{array}$	$\begin{array}{r} 8 \\ +1 \\ \hline 9 \end{array}$	$\begin{array}{r} 1 \\ +9 \\ \hline 10 \end{array}$	$\begin{array}{r} 9 \\ +1 \\ \hline 10 \end{array}$	$\begin{array}{r} 1 \\ +6 \\ \hline 7 \end{array}$	$\begin{array}{r} 6 \\ +1 \\ \hline 7 \end{array}$	$\begin{array}{r} 2 \\ +4 \\ \hline 6 \end{array}$	$\begin{array}{r} 4 \\ +2 \\ \hline 6 \end{array}$

Written Copy 1 through 3. Write each sum. Make practice cards for additions with a sum of 10. See page 20.

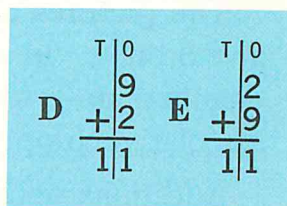
See above.

Sums of 11

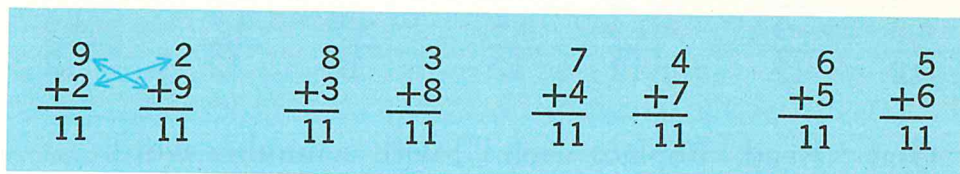


To add 9 and 2, we can first rename 2 as $(1+1)$. Then we can rename $9+2$ as $9+(1+1)$. Using the associative property of addition, we can regroup $9+(1+1)$ as $(9+1)+1$. Can you do all of these steps mentally, and state directly that $9+2=(9+1)+1$? Then add as shown by the () to find $(9+1)+1=10+1$. See A-C above.

In the grids in D and E, the form of the sum, 11 ones, has been changed to 1 ten and 1 one. Do you see that 9 ones + 2 ones = 1 ten + 1 one, or 11? Do 2 ones + 9 ones = 1 ten + 1 one, or 11?



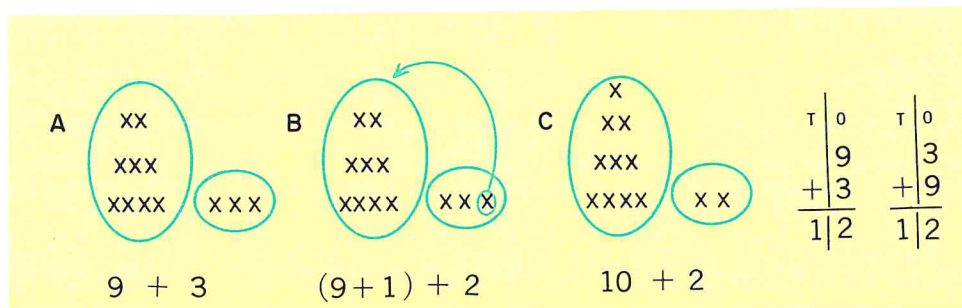
Additions with a sum of 11 are shown in pairs below.



Oral Read. Replace each \square with a number word.

- $8 + 3 = \square$ ^{eleven} $8 + \square = 11$ ^{three} $3 + 8 = \square$ ^{eleven} $3 + \square = 11$ ^{eight}
- $7 + 4 = \square$ ^{eleven} $7 + \square = 11$ ^{four} $4 + 7 = \square$ ^{eleven} $4 + \square = 11$ ^{seven}
- $6 + 5 = \square$ ^{eleven} $6 + \square = 11$ ^{five} $5 + 6 = \square$ ^{eleven} $5 + \square = 11$ ^{six}

Written Copy 1 through 3 in column form. Replace each \square with the missing numeral. Then make practice cards for addition with sums of 11. See page 20.
See above.



Sums of 12

The pictures above show how you can regroup 9 ones and 3 ones. In each grid, the form of the sum has been changed to 1 ten and 2 ones, or 12. How would the associative property of addition be used above?

Additions with a sum of 12 are shown below. Is the commutative property of addition shown below? How?

$\begin{array}{r} 9 \\ +3 \\ \hline 12 \end{array}$	$\begin{array}{r} 3 \\ +9 \\ \hline 12 \end{array}$	$\begin{array}{r} 8 \\ +4 \\ \hline 12 \end{array}$	$\begin{array}{r} 4 \\ +8 \\ \hline 12 \end{array}$	$\begin{array}{r} 7 \\ +5 \\ \hline 12 \end{array}$	$\begin{array}{r} 5 \\ +7 \\ \hline 12 \end{array}$	$\begin{array}{r} 6 \\ +6 \\ \hline 12 \end{array}$
---	---	---	---	---	---	---

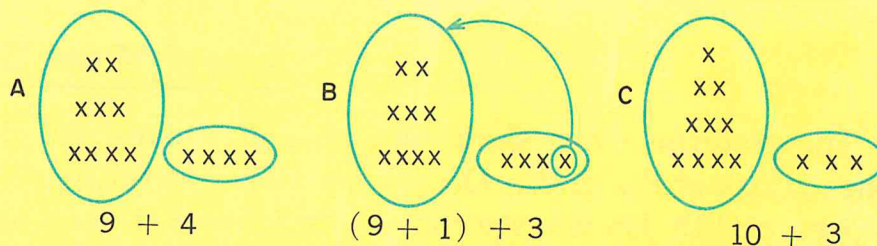
Oral Read. Replace each \square with a number word.

- | | | | |
|--------------------------|--------------------|--------------------------|--------------------|
| a | b | c | d |
| $9 + 3 = \square$ twelve | $9 + 3 = 12$ three | $3 + 9 = \square$ twelve | $3 + 9 = 12$ nine |
| $8 + 4 = \square$ twelve | $8 + 4 = 12$ four | $4 + 8 = \square$ twelve | $4 + 8 = 12$ eight |
| $7 + 5 = \square$ twelve | $7 + 5 = 12$ five | $5 + 7 = \square$ twelve | $5 + 7 = 12$ seven |
| $6 + 6 = \square$ twelve | $6 + 6 = 12$ eight | $6 + 6 = 12$ six | $6 + 6 = 12$ five |

Written Write each addition above in column form, replacing each \square with the missing numeral. Make practice cards for additions with a sum of 12. See page 20. See above.

Sums of 13

Look at the pictures in A, B, and C below. The pictures show how you can regroup 9 ones and 4 ones.



Do you see that 9 ones + 4 ones = 13 ones, or 13? Do you see that 4 ones + 9 ones = 10 ones + 3 ones, or 13? Other combinations with sums of 13 are in F and G.

$$\begin{array}{r} \text{D} \quad \begin{array}{r} \text{T} \ 0 \\ 9 \\ +4 \\ \hline 13 \end{array} \end{array}$$

$$\begin{array}{r} \text{E} \quad \begin{array}{r} \text{T} \ 0 \\ 4 \\ +9 \\ \hline 13 \end{array} \end{array}$$

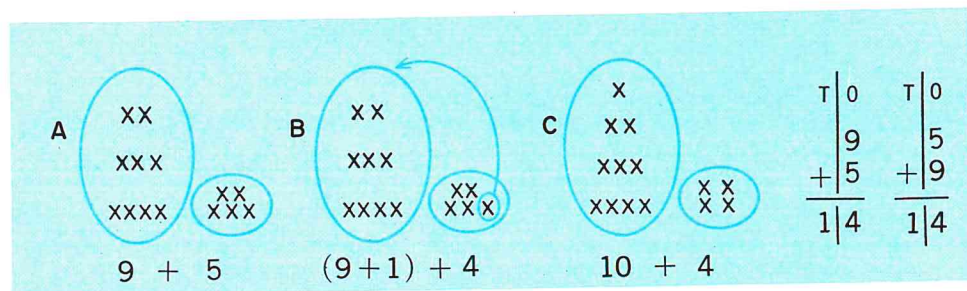
$$\begin{array}{r} \text{F} \quad \begin{array}{r} 8 \quad 5 \\ +5 \quad +8 \\ \hline 13 \quad 13 \end{array} \end{array}$$

$$\begin{array}{r} \text{G} \quad \begin{array}{r} 7 \quad 6 \\ +6 \quad +7 \\ \hline 13 \quad 13 \end{array} \end{array}$$

Oral Read. Replace each \square with a number word.

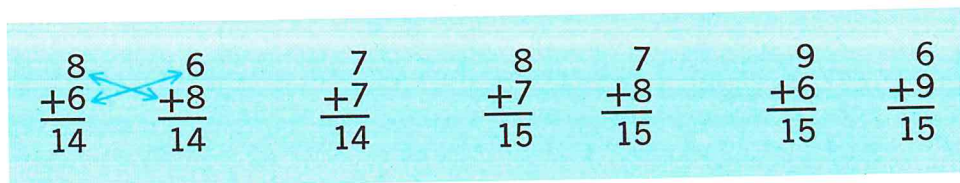
- | | | | |
|--|---|--|--|
| $\overset{a}{9} + 4 = \square \overset{\text{thirteen}}{13}$ | $9 + \overset{b}{\square} = 13$ | $\overset{c}{4} + 9 = \square \overset{\text{thirteen}}{13}$ | $4 + \overset{d}{\square} = 13$ |
| $\overset{\text{thirteen}}{8} + 5 = \square \overset{\text{thirteen}}{13}$ | $8 + \overset{\text{five}}{\square} = 13$ | $\overset{\text{thirteen}}{5} + 8 = \square \overset{\text{thirteen}}{13}$ | $5 + \overset{\text{eight}}{\square} = 13$ |
| $\overset{\text{thirteen}}{7} + 6 = \square \overset{\text{thirteen}}{13}$ | $7 + \overset{\text{six}}{\square} = 13$ | $\overset{\text{thirteen}}{6} + 7 = \square \overset{\text{thirteen}}{13}$ | $6 + \overset{\text{seven}}{\square} = 13$ |
| $\overset{\text{four}}{\square} + 9 = 13$ | $\overset{\text{five}}{\square} + 8 = 13$ | $\overset{\text{six}}{\square} + 7 = 13$ | $\overset{\text{seven}}{\square} + 6 = 13$ |

Written Write each addition above in column form, replacing each \square with the missing numeral. Make practice cards for additions with a sum of 13. See page 20. See above.



Sums of 14 and 15

The pictures above show how to add 9 ones and 5 ones. Look at the grids. Do you see that $9+5=1$ ten + 4 ones, or 14? Do you see that $5+9=1$ ten + 4 ones, or 14? Other additions with sums of 14 and 15 are shown below.



Oral Read. Replace each \square with a number word.

- ^a ^{fourteen}
 $9+5=\square_{14}$

^b ^{five}
 $9+\square_{14}=14$

^c ^{fourteen}
 $5+9=\square_{14}$

^d ^{nine}
 $5+\square_{14}=14$
- ^{fourteen}
 $8+6=\square_{14}$

^{six}
 $8+\square_{14}=14$

^{fourteen}
 $6+8=\square_{14}$

^{eight}
 $6+\square_{14}=14$
- ^{fourteen}
 $7+7=\square_{14}$

^{seven}
 $7+\square_{14}=14$

^{seven}
 $\square_{14}+7=14$

^{nine}
 $\square_{14}+5=14$
- ^{fifteen}
 $9+6=\square_{15}$

^{six}
 $9+\square_{15}=15$

^{fifteen}
 $6+9=\square_{15}$

^{nine}
 $6+\square_{15}=15$
- ^{fifteen}
 $8+7=\square_{15}$

^{seven}
 $8+\square_{15}=15$

^{fifteen}
 $7+8=\square_{15}$

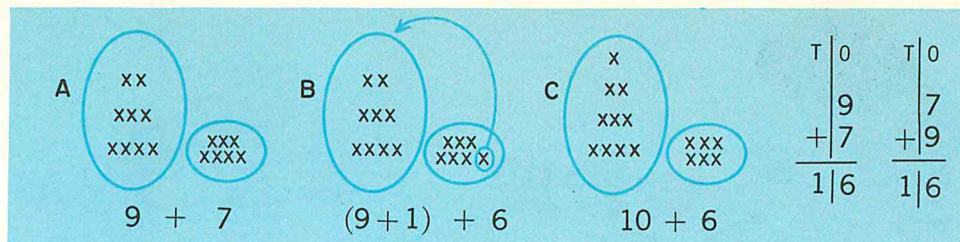
^{eight}
 $7+\square_{15}=15$
- ^{six}
 $\square_{15}+9=15$

^{nine}
 $\square_{15}+6=15$

^{seven}
 $\square_{15}+8=15$

^{seven}
 $\square_{15}+7=14$

Written Write each statement above in column form, replacing the \square with the correct numeral. Make practice cards for additions with sums of 14 and 15. See above.

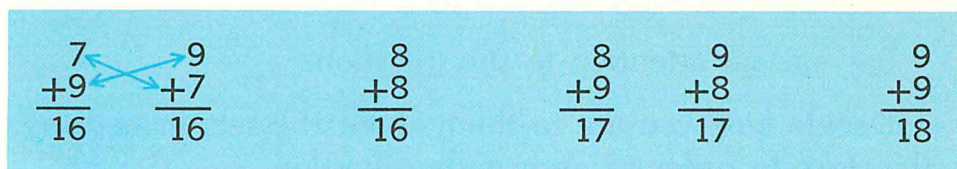


Sums of 16, 17, and 18

The pictures above show how to add 9 ones and 7 ones. Be ready to explain each step.

In the grids above, do you see that $9 + 7 = 1 \text{ ten} + 6 \text{ ones}$, or 16? Do you see that $7 + 9 = 1 \text{ ten} + 6 \text{ ones}$, or 16? What drawings might you make to show that $8 + 8 = 16$? That $9 + 9 = 18$?

Additions with sums of 16, 17, and 18 are shown below.

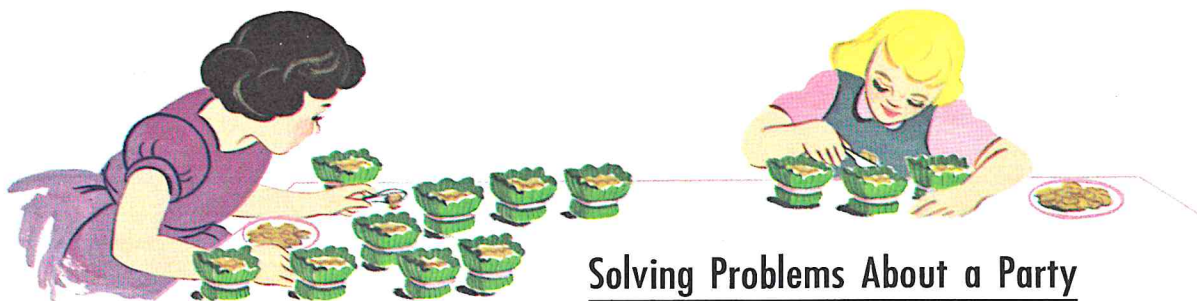


Oral Read. Replace each \square with a number word.

- | | | | |
|-------------------------|--------------------|----------------------|--------------------|
| ^a sixteen | ^b seven | ^c sixteen | ^d nine |
| 1. $9 + 7 = \square 16$ | $9 + \square = 16$ | $7 + 9 = \square 16$ | $7 + \square = 16$ |
| ^{sixteen} | ^{eight} | ^{eight} | ^{nine} |
| 2. $8 + 8 = \square 16$ | $8 + \square = 16$ | $\square + 8 = 16$ | $\square + 7 = 16$ |
| ^{seventeen} | ^{eight} | ^{seventeen} | ^{nine} |
| 3. $9 + 8 = \square 17$ | $9 + \square = 17$ | $8 + 9 = \square 17$ | $8 + \square = 17$ |
| ^{eighteen} | ^{nine} | ^{nine} | ^{nine} |
| 4. $9 + 9 = \square 18$ | $9 + \square = 18$ | $\square + 9 = 18$ | $\square + 8 = 17$ |

Written Write each statement above in column form, replacing each \square with the correct numeral. Make practice cards for additions with sums of 16, 17, and 18. See above.

MORE PRACTICE
PAGE 304



Solving Problems About a Party

Ann had a birthday party. She made up problems about it. To solve some of her problems you will need to put groups, or sets, together. Then you will add the numbers of the sets. In other problems you will need to take sets apart or compare sets to find by how many one set differs from the other. Then you will subtract the numbers of the sets. Follow these steps to help you decide whether to add or subtract.

Read each problem.

Find out the story that is being told.

Pay special attention to the question.

Decide how you are to think about the sets named in the story in order to answer the question.

Oral Tell how to write each of these problems in the language of arithmetic. Tell how you decided.

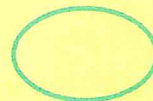
1. Ann invited 8 boys and 7 girls to her party. How many children were invited altogether? $8+7=\square$ 15 children; sets are joined
2. 4 children walked to the party. 6 children rode with Sue's mother. How many more children rode than walked? $6-4=\square$ 2 children; sets are compared

XXXXX
XXX

Number of
boys

XXXXX
XX

Number of
girls



Number of
children



3. In a group of 8 children, 6 children were working puzzles and the others were watching. How many children were watching? $8-6=\square$ 2 children; a set is taken apart
4. Mary filled 9 nut cups and Ann filled 3. How many more nut cups were filled by Mary than by Ann? $9-3=\square$ 6 cups; sets are compared
5. In a balloon hunt, the boys found 4 balloons and the girls found 7 balloons. How many did they find altogether? $4+7=\square$ 11 balloons; sets are joined
6. Ann's mother needed 9 candles for the cake. She could find only 4 candles. How many more candles did she need? $9-4=\square$ 5 candles; sets are compared

Written Write problems 1 through 6 in the language of arithmetic and solve them. See above.

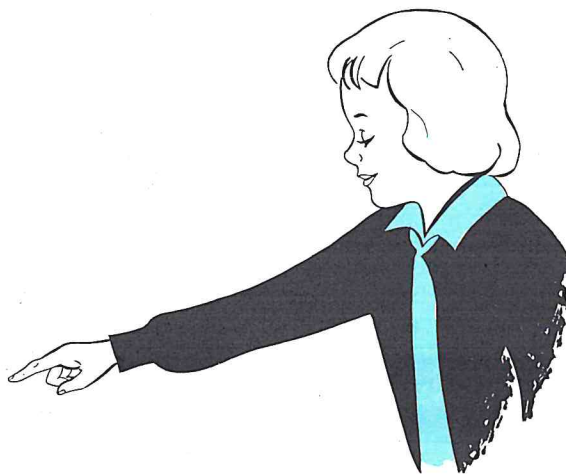
Can you do this? Make up and write a story problem about a party to fit each of these statements.

<i>a</i>	<i>b</i>	<i>c</i>	<i>d</i>
$7+8=\square$	$9-5=\square$	$6+6=\square$	$14-8=\square$

A quick review

	<i>a</i>	<i>b</i>	<i>c</i>	<i>d</i>	<i>e</i>	<i>f</i>	<i>g</i>	<i>h</i>
1.	$\begin{array}{r} 7 \\ +2 \\ \hline 9 \end{array}$	$\begin{array}{r} 9 \\ -2 \\ \hline 7 \end{array}$	$\begin{array}{r} 5 \\ +3 \\ \hline 8 \end{array}$	$\begin{array}{r} 8 \\ -3 \\ \hline 5 \end{array}$	$\begin{array}{r} 4 \\ +3 \\ \hline 7 \end{array}$	$\begin{array}{r} 7 \\ -3 \\ \hline 4 \end{array}$	$\begin{array}{r} 3 \\ +6 \\ \hline 9 \end{array}$	$\begin{array}{r} 9 \\ -6 \\ \hline 3 \end{array}$
2.	$\begin{array}{r} 5 \\ +4 \\ \hline 9 \end{array}$	$\begin{array}{r} 9 \\ -4 \\ \hline 5 \end{array}$	$\begin{array}{r} 2 \\ +6 \\ \hline 8 \end{array}$	$\begin{array}{r} 8 \\ -2 \\ \hline 6 \end{array}$	$\begin{array}{r} 5 \\ +2 \\ \hline 7 \end{array}$	$\begin{array}{r} 7 \\ -2 \\ \hline 5 \end{array}$	$\begin{array}{r} 4 \\ +4 \\ \hline 8 \end{array}$	$\begin{array}{r} 8 \\ -4 \\ \hline 4 \end{array}$

+	1	2	3	4	5	6	7	8	9
1	2	3	4	5	6	7	8	9	10
2	3	4	5	6	7	8	9	10	11
3	4	5	6	7	8	9	10	11	12
4	5	6	7	8	9	10	11	12	13
5	6	7	8	9	10	11	12	13	14
6	7	8	9	10	11	12	13	14	15
7	8	9	10	11	12	13	14	15	16
8	9	10	11	12	13	14	15	16	17
9	10	11	12	13	14	15	16	17	18



Reviewing Addition

Look at the addition table above. The strips start at 7 and 9. The girl is pointing to 16. The sum of 7 and 9 is 16. How did the girl find the sum of 7 and 9 using the addition table?

Oral Read. Replace each \square with a number word. Use the above table for help if you need it.

- | | | | |
|--|---|--|---|
| <p><i>a</i></p> <p>1. $6+9=\square$ ^{fifteen}15</p> <p>2. $7+8=\square$ ^{fifteen}15</p> <p>3. $9+6=\square$ ^{fifteen}15</p> <p>4. $6+4=\square$ ^{ten}10</p> <p>5. $5+8=\square$ ^{thirteen}13</p> <p>6. $8+2=\square$ ^{ten}10</p> <p>7. $9+7=\square$ ^{sixteen}16</p> | <p><i>b</i></p> <p>1. $7+6=\square$ ^{thirteen}13</p> <p>2. $4+9=\square$ ^{thirteen}13</p> <p>3. $7+7=\square$ ^{fourteen}14</p> <p>4. $4+8=\square$ ^{twelve}12</p> <p>5. $6+6=\square$ ^{twelve}12</p> <p>5. $5+9=\square$ ^{fourteen}14</p> <p>8. $8+9=\square$ ^{seventeen}17</p> | <p><i>c</i></p> <p>5. $5+7=\square$ ^{twelve}12</p> <p>3. $3+8=\square$ ^{eleven}11</p> <p>8. $8+4=\square$ ^{twelve}12</p> <p>8. $8+7=\square$ ^{fifteen}15</p> <p>2. $2+9=\square$ ^{eleven}11</p> <p>4. $4+7=\square$ ^{eleven}11</p> <p>3. $3+7=\square$ ^{ten}10</p> | <p><i>d</i></p> <p>4. $4+6=\square$ ^{ten}10</p> <p>1. $1+9=\square$ ^{ten}10</p> <p>9. $9+2=\square$ ^{eleven}11</p> <p>6. $6+8=\square$ ^{fourteen}14</p> <p>7. $7+4=\square$ ^{eleven}11</p> <p>2. $2+8=\square$ ^{ten}10</p> <p>8. $8+5=\square$ ^{thirteen}13</p> |
|--|---|--|---|

Written Write each statement above in column form, replacing each \square with the correct numeral. See above.



More Help in Solving Problems

One day 5 orioles and 9 robins were in our yard. How many birds were there altogether?

You are to join groups, or sets, so you are to add the numbers. Is *birds* a name that stands for either orioles or robins?

Oral Read each of these problems carefully. Tell the arithmetic statement you would use. Tell the name you would give the answer and why you chose it.

1. A farmer had 8 cows and 7 horses in a field. How many animals were in the field? $8+7=\square$ 15 animals
2. There were 9 spellers and 9 arithmetics on a desk. How many books were on the desk? $9+9=\square$ 18 books
3. John counted 8 sweaters and 9 mittens in the "Lost and Found" box. How many pieces of clothing did he count altogether? $8+9=\square$ 17 pieces of clothing
4. There were 9 men and 7 women on the bus. How many people were on the bus? $9+7=\square$ 16 people

Written Write problems 1 through 4 in the language of arithmetic and solve them. Write the name of each sum. See above.

Help with Addition and Subtraction

Suppose that you forget the sum of an addition such as $9+7$. It may help to change the order as in A. Which property of addition would you be using?

In $9+7=\square$ you could think of the 7 as $1+6$ and add as in B. The $()$ mean: "Do this first." Which property of addition would you be using?

If you forget a difference such as $8-6$, think of a matching addition as in C.

A $7+9=16$
 Then
 $9+7=16$

B $9+(1+6)=\square$
 Then
 $(9+1)+6=\square$
 Then
 $10+6=16$

C $2+6=8$
 Then
 $8-6=2$

Oral Read. Replace each \square with a number word.

- | <i>a</i>
eleven | <i>b</i>
seventeen | <i>c</i>
sixteen | <i>d</i>
fifteen |
|-----------------------|-----------------------|---------------------|---------------------|
| 1. $6+5=\square_{11}$ | $8+9=\square_{17}$ | $9+7=\square_{16}$ | $6+9=\square_{15}$ |
| 2. $7+6=\square_{13}$ | $7+8=\square_{15}$ | $9+6=\square_{15}$ | $7+7=\square_{14}$ |
| 3. $8+4=\square_{12}$ | $9+2=\square_{11}$ | $6+4=\square_{10}$ | $8+7=\square_{15}$ |
| 4. $6+8=\square_{14}$ | $6+6=\square_{12}$ | $7+4=\square_{11}$ | $8+2=\square_{10}$ |
| 5. $8+5=\square_{13}$ | $9+5=\square_{14}$ | $8+8=\square_{16}$ | $9+9=\square_{18}$ |
| 6. $8+6=\square_{14}$ | $9+4=\square_{13}$ | $9+3=\square_{12}$ | $6+7=\square_{13}$ |
| 7. $9+8=\square_{17}$ | $7+9=\square_{16}$ | $7+5=\square_{12}$ | $8+3=\square_{11}$ |

Written Write each statement above in column form, replacing the \square with the missing numeral. Use the helps in A, B, and C above to find the correct answer. See above.

Checkup Time

The numerals in () tell the pages where you can turn for help if you need it.

Important Ideas

- 1. A number line can help you find addition combinations. (49)
- 2. When you write the numeral that stands for ten ones, you change the form of ten ones to 1 ten and write 1 in the tens place and 0 in the ones place. (50)
- 3. The answer to a problem includes a numeral and a name for the objects in the sets. (59)
- 4. Changing the order or grouping of the addends does not change the sum. (50-55, 60)

Questions to Discuss

See T61 for answers.

1. What digits will name the sum at the right? Where would you place them? (50)

T	0
	6
	<u>+4</u>

- 2. How can you tell whether to add or subtract in order to solve a problem? (56)
- 3. What can you do to find the difference in a subtraction if you forget it? (60)

4. Can you change the order or grouping of addends without changing the sum? (50-55, 60)

Oral Practice

See T61 for answers.

In each of these problems, tell how to decide whether you should add or subtract to solve it. (56)

- 1. Peter had 4 chocolate cookies. Jim had only 2 cookies. How many fewer cookies did Jim have than Peter?
- 2. Susan had 3 pears in a basket. Mary put in 4 apples. How many pieces of fruit did they have altogether?
- 3. Carl has 7 brothers and sisters. Sally has 4 brothers and sisters. How many more brothers and sisters has Carl than Sally?

Written Practice

See T61 for answers.

Write each of the above problems in the language of arithmetic. Solve each one. (56)

Self-Evaluation

Part 1 Copy. Write each sum or difference. The signs tell you whether to add or subtract.

	<i>a</i>	<i>b</i>	<i>c</i>	<i>d</i>
1.	$\begin{array}{r} 7 \\ -5 \\ \hline 2 \end{array}$	$\begin{array}{r} 8 \\ +3 \\ \hline 11 \end{array}$	$\begin{array}{r} 7 \\ +4 \\ \hline 11 \end{array}$	$\begin{array}{r} 8 \\ -1 \\ \hline 7 \end{array}$
2.	$\begin{array}{r} 7 \\ -3 \\ \hline 4 \end{array}$	$\begin{array}{r} 5 \\ +7 \\ \hline 12 \end{array}$	$\begin{array}{r} 7 \\ +9 \\ \hline 16 \end{array}$	$\begin{array}{r} 9 \\ +9 \\ \hline 18 \end{array}$
3.	$\begin{array}{r} 8 \\ +6 \\ \hline 14 \end{array}$	$\begin{array}{r} 5 \\ -3 \\ \hline 2 \end{array}$	$\begin{array}{r} 4 \\ +8 \\ \hline 12 \end{array}$	$\begin{array}{r} 8 \\ -3 \\ \hline 5 \end{array}$
4.	$\begin{array}{r} 8 \\ -2 \\ \hline 6 \end{array}$	$\begin{array}{r} 9 \\ +5 \\ \hline 14 \end{array}$	$\begin{array}{r} 6 \\ +9 \\ \hline 15 \end{array}$	$\begin{array}{r} 9 \\ -5 \\ \hline 4 \end{array}$
5.	$\begin{array}{r} 7 \\ +3 \\ \hline 10 \end{array}$	$\begin{array}{r} 8 \\ +4 \\ \hline 12 \end{array}$	$\begin{array}{r} 4 \\ +9 \\ \hline 13 \end{array}$	$\begin{array}{r} 4 \\ -3 \\ \hline 1 \end{array}$
6.	$\begin{array}{r} 4 \\ -2 \\ \hline 2 \end{array}$	$\begin{array}{r} 5 \\ +9 \\ \hline 14 \end{array}$	$\begin{array}{r} 9 \\ -8 \\ \hline 1 \end{array}$	$\begin{array}{r} 8 \\ +9 \\ \hline 17 \end{array}$
7.	$\begin{array}{r} 9 \\ -7 \\ \hline 2 \end{array}$	$\begin{array}{r} 9 \\ +8 \\ \hline 17 \end{array}$	$\begin{array}{r} 9 \\ +4 \\ \hline 13 \end{array}$	$\begin{array}{r} 4 \\ -4 \\ \hline 0 \end{array}$
8.	$\begin{array}{r} 5 \\ +8 \\ \hline 13 \end{array}$	$\begin{array}{r} 6 \\ -2 \\ \hline 4 \end{array}$	$\begin{array}{r} 9 \\ +3 \\ \hline 12 \end{array}$	$\begin{array}{r} 9 \\ -3 \\ \hline 6 \end{array}$

Part 2 Copy the numerals below. Draw a circle around each digit that stands for tens.

<i>a</i>	<i>b</i>	<i>c</i>	<i>d</i>
36	84	72	18

Part 3 Copy. Write each sum. Add down. Check by adding in a different order.

	<i>a</i>	<i>b</i>	<i>c</i>	<i>d</i>
1.	$\begin{array}{r} 1 \\ 3 \\ +5 \\ \hline 9 \end{array}$	$\begin{array}{r} 5 \\ 1 \\ +1 \\ \hline 7 \end{array}$	$\begin{array}{r} 1 \\ 4 \\ +3 \\ \hline 8 \end{array}$	$\begin{array}{r} 2 \\ 1 \\ +3 \\ \hline 6 \end{array}$
2.	$\begin{array}{r} 4 \\ 0 \\ +3 \\ \hline 7 \end{array}$	$\begin{array}{r} 1 \\ 0 \\ +5 \\ \hline 6 \end{array}$	$\begin{array}{r} 5 \\ 1 \\ +1 \\ \hline 7 \end{array}$	$\begin{array}{r} 2 \\ 5 \\ +0 \\ \hline 7 \end{array}$

Part 4 Solve problems 1 through 5 below.

1. Bill can buy a writing pad for 9¢. He has 7¢ now. How many more cents does Bill need in order to buy the writing pad?
9-7=□ 2¢

2. There are 7 girls in one row and 8 girls in another row. How many girls are in both rows?
7+8=□ 15 girls

3. A box of salt costs 7¢ and a box of sugar costs 9¢. How much do the 2 boxes cost? 7+9=□ 16¢

4. Ann's box of crayons held 8 crayons. She lost 2 of the crayons. How many were left?
8-2=□ 6 crayons

5. Tim earned 8¢. Jim earned 3¢. How much more money did Tim earn than Jim? 8-3=□ 5¢



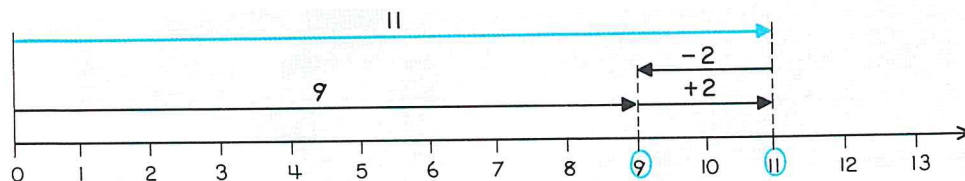
Subtracting from 10

Jane needs 2 of the 10 eggs for the cake, so she takes 2 eggs from the basket. To find how many eggs are left in the basket, you can subtract the numbers of the two groups, or sets, of eggs. The arithmetic statement is $10 - 2 = \square$. You know that $8 + 2 = 10$. Does $10 - 2 = 8$?

Oral Read. Replace each \square with a number word.

<i>a</i>	<i>b</i>	<i>c</i>	<i>d</i>
1. $9 + 1 = 10$	$10 - 1 = \square$ ^{nine}	$1 + 9 = 10$	$10 - 9 = \square$ ^{one}
2. $8 + 2 = 10$	$10 - 2 = \square$ ^{eight}	$2 + 8 = 10$	$10 - 8 = \square$ ^{two}
3. $7 + 3 = 10$	$10 - 3 = \square$ ^{seven}	$3 + 7 = 10$	$10 - 7 = \square$ ^{three}
4. $6 + 4 = 10$	$10 - 4 = \square$ ^{six}	$4 + 6 = 10$	$10 - 6 = \square$ ^{four}
5. $5 + 5 = 10$	$10 - 5 = \square$ ^{five}	$10 - 5 = 5$	$10 \square - 5 = 5$ ^{ten}
6. $10 - 1 = 9$	$10 - 9 = \square$ ^{one}	$10 - 2 = 8$	$10 - \square = 2$ ^{eight}
7. $10 - 3 = 7$	$10 - \square = 3$ ^{seven}	$10 - 4 = 6$	$10 - \square = 4$ ^{six}

Written Write each statement in columns *b* and *d* above, replacing each \square with the correct numeral. Make practice cards for subtractions from 10. See page 20.
See above.



Subtracting from 11

Move your finger to the right along the number line from 0 to 9 and stop. Move it to the right again, stopping at 11. You have shown that $9+2=11$. Now move your finger to the left, 2 spaces back from 11. You have found that $11-2=9$.

Tell how each subtraction shown below *undoes* each matching *addition*.

$$\begin{array}{r} 9 \quad 11 \\ +2 \leftrightarrow -2 \\ \hline 11 \quad 9 \end{array}$$

$$\begin{array}{r} 8 \quad 11 \\ +3 \leftrightarrow -3 \\ \hline 11 \quad 8 \end{array}$$

$$\begin{array}{r} 7 \quad 11 \\ +4 \leftrightarrow -4 \\ \hline 11 \quad 7 \end{array}$$

$$\begin{array}{r} 6 \quad 11 \\ +5 \leftrightarrow -5 \\ \hline 11 \quad 6 \end{array}$$

$$\begin{array}{r} 2 \quad 11 \\ +9 \leftrightarrow -9 \\ \hline 11 \quad 2 \end{array}$$

$$\begin{array}{r} 3 \quad 11 \\ +8 \leftrightarrow -8 \\ \hline 11 \quad 3 \end{array}$$

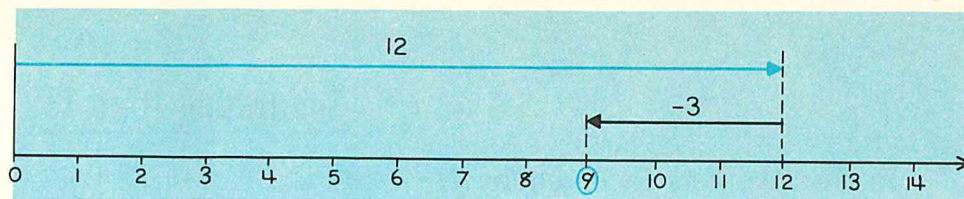
$$\begin{array}{r} 4 \quad 11 \\ +7 \leftrightarrow -7 \\ \hline 11 \quad 4 \end{array}$$

$$\begin{array}{r} 5 \quad 11 \\ +6 \leftrightarrow -6 \\ \hline 11 \quad 5 \end{array}$$

Oral Read. Replace each \square with a number word. Use the number line for help if you need it.

- | | <i>a</i> | <i>b</i> | <i>c</i> | <i>d</i> |
|----|--|---------------------------------------|--|--|
| 1. | $11-2=\overset{\text{nine}}{\square}$ | $11-9=\overset{\text{two}}{\square}$ | $11-3=\overset{\text{eight}}{\square}$ | $11-8=\overset{\text{three}}{\square}$ |
| 2. | $11-4=\overset{\text{seven}}{\square}$ | $11-7=\overset{\text{four}}{\square}$ | $11-5=\overset{\text{six}}{\square}$ | $11-6=\overset{\text{five}}{\square}$ |
| 3. | $11-\overset{\text{eight}}{\square}=3$ | $11-\overset{\text{two}}{\square}=9$ | $11-\overset{\text{four}}{\square}=7$ | $11-\overset{\text{three}}{\square}=8$ |

Written Write each subtraction above in column form, replacing each \square with the missing numeral. Then make practice cards for the subtractions from 11. See page 20.
See above.



Subtracting from 12

Move your finger to the right along the number line from 0 to 12 and stop. Now move your finger to the left, 3 spaces back from 12. Do you see that $12 - 3 = 9$?

Read each pair of statements below. Tell how subtraction is the inverse operation of addition.

$$\begin{array}{r} 9 \quad 12 \\ +3 \leftrightarrow -3 \\ \hline 12 \quad 9 \end{array}$$

$$\begin{array}{r} 8 \quad 12 \\ +4 \leftrightarrow -4 \\ \hline 12 \quad 8 \end{array}$$

$$\begin{array}{r} 7 \quad 12 \\ +5 \leftrightarrow -5 \\ \hline 12 \quad 7 \end{array}$$

$$\begin{array}{r} 3 \quad 12 \\ +9 \leftrightarrow -9 \\ \hline 12 \quad 3 \end{array}$$

$$\begin{array}{r} 4 \quad 12 \\ +8 \leftrightarrow -8 \\ \hline 12 \quad 4 \end{array}$$

$$\begin{array}{r} 5 \quad 12 \\ +7 \leftrightarrow -7 \\ \hline 12 \quad 5 \end{array}$$

Oral Read. Replace each \square with a number word. Use the number line above if you need help.

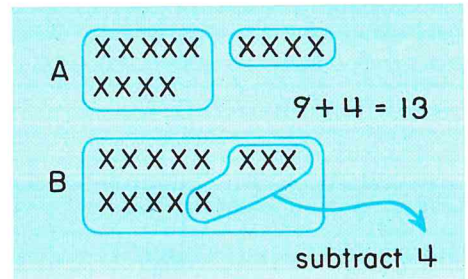
- | | | | |
|--|---------------------------------------|---------------------------------------|---------------------------------------|
| a | b | c | d |
| 1. $12 - 3 = \boxed{9}$ ^{nine} | $12 - 4 = \boxed{8}$ ^{eight} | $12 - 5 = \boxed{7}$ ^{seven} | $12 - 6 = \boxed{6}$ ^{six} |
| 2. $12 - 9 = \boxed{3}$ ^{three} | $12 - 8 = \boxed{4}$ ^{four} | $12 - 7 = \boxed{5}$ ^{five} | $11 - \square = 4$ ^{eleven} |
| 3. $11 - 8 = \boxed{3}$ ^{three} | $11 - \square = 7$ ^{eleven} | $12 - \square = 7$ ^{twelve} | $12 - \boxed{3} = 9$ ^{three} |
| 4. $12 - \boxed{4} = 8$ ^{four} | $12 - \boxed{5} = 7$ ^{five} | $11 - \boxed{5} = 6$ ^{five} | $11 - \boxed{3} = 8$ ^{three} |

Written Write each subtraction above in column form, replacing each \square with the missing numeral. Then make practice cards for subtractions from 12. See page 20.

See above.

Subtracting from 13

In the two sets in A, each X stands for a one. In A, 4 ones are added to 9 ones. In B, the 4 ones are subtracted, or removed, from 13 ones. Do you see that $9+4=13$ and $13-4=9$?



Matching addition and subtraction statements are shown in column form below. Read each statement.

$$\begin{array}{r} 9 \\ +4 \\ \hline 13 \end{array} \longleftrightarrow \begin{array}{r} 13 \\ -4 \\ \hline 9 \end{array}$$

$$\begin{array}{r} 8 \\ +5 \\ \hline 13 \end{array} \longleftrightarrow \begin{array}{r} 13 \\ -5 \\ \hline 8 \end{array}$$

$$\begin{array}{r} 7 \\ +6 \\ \hline 13 \end{array} \longleftrightarrow \begin{array}{r} 13 \\ -6 \\ \hline 7 \end{array}$$

$$\begin{array}{r} 4 \\ +9 \\ \hline 13 \end{array} \longleftrightarrow \begin{array}{r} 13 \\ -9 \\ \hline 4 \end{array}$$

$$\begin{array}{r} 5 \\ +8 \\ \hline 13 \end{array} \longleftrightarrow \begin{array}{r} 13 \\ -8 \\ \hline 5 \end{array}$$

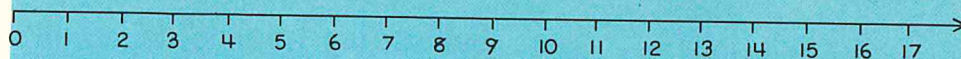
$$\begin{array}{r} 6 \\ +7 \\ \hline 13 \end{array} \longleftrightarrow \begin{array}{r} 13 \\ -7 \\ \hline 6 \end{array}$$

Oral Read. Replace each \square with a number word.

- | <i>a</i> | <i>b</i> | <i>c</i> | <i>d</i> |
|--------------------------------|-----------------------------|-----------------------------|-----------------------------|
| 1. $13-9=\square$ <i>four</i> | $13-8=\square$ <i>five</i> | $13-7=\square$ <i>six</i> | $13-6=\square$ <i>seven</i> |
| 2. $13-5=\square$ <i>eight</i> | $13-4=\square$ <i>nine</i> | $12-4=\square$ <i>eight</i> | $12-\square=4$ <i>eight</i> |
| 3. $\square-6=5$ <i>eleven</i> | $13-\square=6$ <i>seven</i> | $\square-5=6$ <i>eleven</i> | $\square-4=6$ <i>ten</i> |
| 4. $11-4=\square$ <i>seven</i> | $12-6=\square$ <i>six</i> | $12-\square=7$ <i>five</i> | $10-6=\square$ <i>four</i> |
| 5. $10-\square=3$ <i>seven</i> | $11-\square=7$ <i>four</i> | $10-\square=5$ <i>five</i> | $12-7=\square$ <i>five</i> |

Written Write each subtraction above in column form, replacing each \square with the missing numeral. Then make practice cards for subtractions from 13. See page 20.

See above.



Subtracting from 14 or 15

You can go from 0 to 9 on the number line by taking 9 steps to the right. By taking another 6 steps to the right, you reach 15. 9 steps + 6 steps are 15 steps. If you take 6 steps to the left from 15, you reach 9. $15 - 6 = 9$. Use the number line to find the difference in $14 - 5 = \square$.

Matching addition and subtraction statements are shown in column form below. Read each statement.

$$\begin{array}{r} 9 \quad 14 \\ 5 \leftrightarrow -5 \\ \hline 14 \quad 9 \end{array}$$

$$\begin{array}{r} 8 \quad 14 \\ +6 \leftrightarrow -6 \\ \hline 14 \quad 8 \end{array}$$

$$\begin{array}{r} 7 \quad 14 \\ +7 \leftrightarrow -7 \\ \hline 14 \quad 7 \end{array}$$

$$\begin{array}{r} 6 \quad 14 \\ +8 \leftrightarrow -8 \\ \hline 14 \quad 6 \end{array}$$

$$\begin{array}{r} 5 \quad 14 \\ +9 \leftrightarrow -9 \\ \hline 14 \quad 5 \end{array}$$

$$\begin{array}{r} 9 \quad 15 \\ +6 \leftrightarrow -6 \\ \hline 15 \quad 9 \end{array}$$

$$\begin{array}{r} 8 \quad 15 \\ +7 \leftrightarrow -7 \\ \hline 15 \quad 8 \end{array}$$

$$\begin{array}{r} 7 \quad 15 \\ +8 \leftrightarrow -8 \\ \hline 15 \quad 7 \end{array}$$

Oral Read. Replace each \square with a number word. Use the number line above for help if you need it.

- | <i>a</i> | <i>b</i> | <i>c</i> | <i>d</i> |
|---|--|--|--|
| 1. $14 - 9 = \square$ five | $14 - 8 = \square$ six | $14 - 7 = \square$ seven | $14 - 6 = \square$ eight |
| 2. $14 - 5 = \square$ nine | $15 - 9 = \square$ six | $15 - 8 = \square$ seven | $15 - 7 = \square$ eight |
| 3. $14 - \square = 6$ eight | $15 - \square = 7$ eight | $14 - \square = 9$ five | $15 - \square = 6$ nine |

Written Write each subtraction above in column form, replacing each \square with the missing numeral. Make practice cards for subtractions from 14 and 15. See page 20.
See above.

Subtracting from 16, 17, or 18

Mary had 16 shells in a collection. Judy had 9 shells in her collection. How many more shells had Mary than Judy?

You are to find how many more in one group, or set, than in another. Therefore you subtract the numbers of the sets. As you can see, 16 is 7 more than 9. Thus $16 - 9 = 7$.

XXXXXX
XXXXXX
XXXXXX
X

Mary's shells

XXXXXX
XXXX

Judy's shells

Missing number

Matching addition and subtraction statements are shown in column form below. Read each statement.

$$\begin{array}{r} 9 \\ +7 \\ \hline 16 \end{array} \longleftrightarrow \begin{array}{r} 16 \\ -7 \\ \hline 9 \end{array}$$

$$\begin{array}{r} 8 \\ +9 \\ \hline 17 \end{array} \longleftrightarrow \begin{array}{r} 17 \\ -9 \\ \hline 8 \end{array}$$

$$\begin{array}{r} 8 \\ +8 \\ \hline 16 \end{array} \longleftrightarrow \begin{array}{r} 16 \\ -8 \\ \hline 8 \end{array}$$

$$\begin{array}{r} 7 \\ +9 \\ \hline 16 \end{array} \longleftrightarrow \begin{array}{r} 16 \\ -9 \\ \hline 7 \end{array}$$

$$\begin{array}{r} 9 \\ +8 \\ \hline 17 \end{array} \longleftrightarrow \begin{array}{r} 17 \\ -8 \\ \hline 9 \end{array}$$

$$\begin{array}{r} 9 \\ +9 \\ \hline 18 \end{array} \longleftrightarrow \begin{array}{r} 18 \\ -9 \\ \hline 9 \end{array}$$

Oral Read. Replace each \square with a number word. Make pictures to show each subtraction if you need help.

1. $16 - \overset{a}{\square} = 8$ $18 - 9 = \overset{b}{\square}$ $17 - \overset{c}{\square} = 9$ $16 - 7 = \overset{d}{\square}$
2. $17 - 9 = \overset{eight}{\square}$ $16 - \overset{seven}{\square} = 9$ $\square - 9 = 8$ $\square - 8 = 8$

Written Write the subtractions above in column form, replacing each \square with the missing numeral. Then make practice cards for subtractions from 16, 17, and 18.

See above.

Reviewing Subtraction

You have used a table to find sums. You can use the same table to find differences because subtraction is the inverse operation of addition. To find the difference in $14 - 6 = \square$, first find all of the 14's in the table. Then find the 14 which is directly under the subtrahend, 6. Fol-

low the row that the 14 is in to the left to find the difference, 8. This shows that $14 - 6 = 8$, or that $8 + 6 = 14$.

—	1	2	3	4	5	6	7	8	9
1	2	3	4	5	6	7	8	9	10
2	3	4	5	6	7	8	9	10	11
3	4	5	6	7	8	9	10	11	12
4	5	6	7	8	9	10	11	12	13
5	6	7	8	9	10	11	12	13	14
6	7	8	9	10	11	12	13	14	15
7	8	9	10	11	12	13	14	15	16
8	9	10	11	12	13	14	15	16	17
9	10	11	12	13	14	15	16	17	18

Subtraction Table

Oral Read. Replace each \square with a number word.

1. $12 - 7 = \square$ ^{a five} $13 - 6 = \square$ ^{b seven} $17 - 8 = \square$ ^{c nine} $16 - 9 = \square$ ^{d seven}
 2. $18 - 9 = \square$ ^{nine} $17 - 9 = \square$ ^{eight} $16 - 8 = \square$ ^{eight} $14 - 7 = \square$ ^{seven}

Written Copy. Replace each \square with the missing numeral. Use the table for help if you need it.

1. $7 + 7 = \square$ ^{a 14} $14 - 7 = \square$ ^{b 7} $8 + 8 = \square$ ^{c 16} $16 - 8 = \square$ ^{d 8}
 2. $9 + 5 = \square$ ¹⁴ $14 - 5 = \square$ ⁹ $5 + 9 = \square$ ¹⁴ $14 - 9 = \square$ ⁵
 3. $9 + 6 = \square$ ¹⁵ $15 - 6 = \square$ ⁹ $6 + 9 = \square$ ¹⁵ $15 - 9 = \square$ ⁶
 4. $7 + 8 = \square$ ¹⁵ $15 - 8 = \square$ ⁷ $9 + 9 = \square$ ¹⁸ $18 - 9 = \square$ ⁹
 5. $9 + 4 = \square$ ¹³ $13 - 4 = \square$ ⁹ $8 + 6 = \square$ ¹⁴ $14 - 6 = \square$ ⁸

Using Subtraction in Problem Solving

To solve a story problem, you begin by changing it into an arithmetic statement. Then you find the missing number. These steps will help you solve problems.

Read each problem.

Find out what story is told.

Pay special attention to the question.

Decide what you might do with the groups, or sets, to answer the question in the problem. Add the numbers if the sets are to be put together. If a set is to be taken apart, or if you are to find by how many one set differs from another, subtract the numbers.

Oral Read each of these problems. Tell how each one can be changed into an arithmetic statement. Then tell how you knew which statement to use.

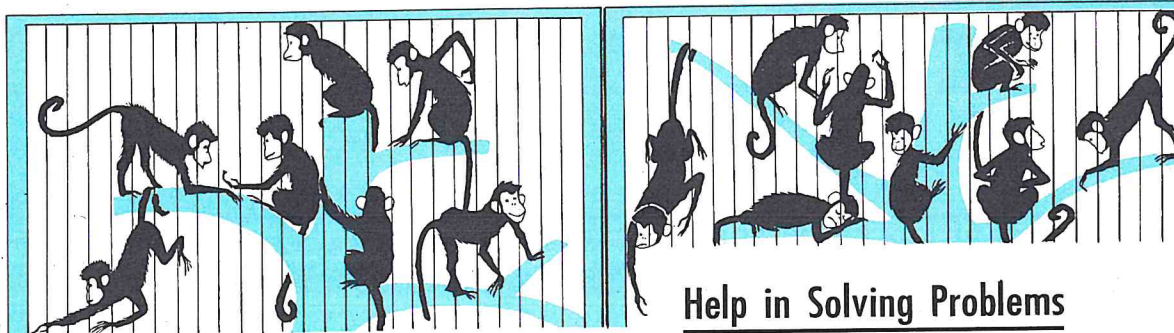
1. Paul had 15 answers correct on a test. Mark had 9 answers correct. How many fewer correct answers did Mark have than Paul? $15-9=\square$ 6 fewer; sets are compared
2. Mavis bought 6 candy canes at the store. She gave 3 of them to her little brothers. How many candy canes did she keep for herself? $6-3=\square$ 3 candy canes; a set is taken apart
3. Milton had 8 pencils in his pencil box. He needed 12 pencils to fill it. How many more pencils must he buy to fill the pencil box? $12-8=\square$ 4 pencils; sets are compared
4. There were 17 books on the library table in the morning. At noon there were only 9 books left. How many of the books had been taken away? $17-9=\square$ 8 books; a set is taken apart

Written Follow the steps on page 70 to help you decide how to solve these problems. Then write each problem in the language of arithmetic and solve it.

1. For lunch Sue bought a sandwich for 18¢. Then she bought a bowl of soup for 9¢. How much more did she spend for the sandwich than for the soup? $18-9=\square$ 9¢
2. In his garden, Sam has 12 rows of vegetables and 5 rows of flowers. How many fewer rows of flowers than rows of vegetables does he have? $12-5=\square$ 7 fewer rows
3. There were 16 pieces of chalk in the box. The teacher put 7 of them on the chalk ledge. How many pieces of chalk were left in the box? $16-7=\square$ 9 pieces
4. Fred counted 9 sheets of green paper in the cupboard. He counted 4 sheets of red paper. How many fewer sheets of red paper than of green paper were there? $9-4=\square$ 5 fewer sheets
5. Bob wants a whistle that costs 15 cents. He has 9 pennies. How many more pennies does he need? $15-9=\square$ 6 pennies

A quick review

	<i>a</i>	<i>b</i>	<i>c</i>	<i>d</i>	<i>e</i>	<i>f</i>	<i>g</i>	<i>h</i>
1.	$\begin{array}{r} 11 \\ -8 \\ \hline 3 \end{array}$	$\begin{array}{r} 12 \\ -8 \\ \hline 4 \end{array}$	$\begin{array}{r} 14 \\ -6 \\ \hline 8 \end{array}$	$\begin{array}{r} 13 \\ -5 \\ \hline 8 \end{array}$	$\begin{array}{r} 16 \\ -9 \\ \hline 7 \end{array}$	$\begin{array}{r} 12 \\ -5 \\ \hline 7 \end{array}$	$\begin{array}{r} 14 \\ -5 \\ \hline 9 \end{array}$	$\begin{array}{r} 15 \\ -6 \\ \hline 9 \end{array}$
2.	$\begin{array}{r} 18 \\ -9 \\ \hline 9 \end{array}$	$\begin{array}{r} 11 \\ -4 \\ \hline 7 \end{array}$	$\begin{array}{r} 12 \\ -3 \\ \hline 9 \end{array}$	$\begin{array}{r} 15 \\ -7 \\ \hline 8 \end{array}$	$\begin{array}{r} 14 \\ -9 \\ \hline 5 \end{array}$	$\begin{array}{r} 13 \\ -4 \\ \hline 9 \end{array}$	$\begin{array}{r} 12 \\ -6 \\ \hline 6 \end{array}$	$\begin{array}{r} 13 \\ -6 \\ \hline 7 \end{array}$
3.	$\begin{array}{r} 11 \\ -5 \\ \hline 6 \end{array}$	$\begin{array}{r} 13 \\ -8 \\ \hline 5 \end{array}$	$\begin{array}{r} 16 \\ -8 \\ \hline 8 \end{array}$	$\begin{array}{r} 12 \\ -4 \\ \hline 8 \end{array}$	$\begin{array}{r} 11 \\ -9 \\ \hline 2 \end{array}$	$\begin{array}{r} 17 \\ -8 \\ \hline 9 \end{array}$	$\begin{array}{r} 15 \\ -9 \\ \hline 6 \end{array}$	$\begin{array}{r} 11 \\ -7 \\ \hline 4 \end{array}$
4.	$\begin{array}{r} 15 \\ -8 \\ \hline 7 \end{array}$	$\begin{array}{r} 16 \\ -7 \\ \hline 9 \end{array}$	$\begin{array}{r} 13 \\ -7 \\ \hline 6 \end{array}$	$\begin{array}{r} 11 \\ -3 \\ \hline 8 \end{array}$	$\begin{array}{r} 12 \\ -9 \\ \hline 3 \end{array}$	$\begin{array}{r} 14 \\ -7 \\ \hline 7 \end{array}$	$\begin{array}{r} 17 \\ -9 \\ \hline 8 \end{array}$	$\begin{array}{r} 12 \\ -7 \\ \hline 5 \end{array}$



Help in Solving Problems

Before you can decide whether to add or to subtract in solving a problem, you should think about the story and the question.

If the question means:	Then you are to:
how many there are altogether	join the sets, or add the numbers of the sets.
how many are left	separate a set into parts, or subtract the numbers of the sets.
how many are gone	
how many more	compare the sets to find by how many they differ, or subtract the numbers of the sets.
how many fewer	
how many more are needed	

Oral Be ready to tell how to write the arithmetic statements for problems 1 through 3. Then give the answers.

- There were 7 monkeys in one cage and 8 in another. How many monkeys were in the two cages? $7+8=\square$
15 monkeys
- Jack's father used 6 of the 14 large nails he had. How many large nails were left? $14-6=\square$ 8 nails
- We counted 4 wrens, 5 robins, and 7 sparrows in our yard. How many birds did we count? $4+5+7=\square$ 16 birds

Written Solve problems 1 through 6. Write your answers. Check your work.

See also T73.

1. Bill had 15¢. Jack had 8¢.
How much less money did Jack have than Bill? $15-8=\square$
2. ^{7¢} Ann's mother made 15 sandwiches. The children ate 9.
How many sandwiches were left? $15-9=\square$ 6 sandwiches
3. Mary had 5 fish in her pool. Her uncle gave her 9 fish.
How many fish did Mary have then? $5+9=\square$ 14 fish
4. Dick had 17¢. He now has 8¢. How much did he spend?
 $17-8=\square$ 9¢
5. Carol had 4 cookies in her lunch. She has 1 cookie left.
How many did she eat?
 $4-1=\square$ 3 cookies
6. 5 children were playing ball. 7 more children joined them.
How many children were there altogether? $5+7=\square$ 12 children



Can you do this? Use the numerals 1, 3, 5, and 7. Use the sign, +, +, -, -. Construct the numerals for the numbers one through sixteen, using any or all of the numerals and signs. Three examples are given.

a
 $1=5-1-3$

b
 $2=5-3$

c
 $3=5-3+1$

Reviewing Addition and Subtraction

You know that each addition statement has a matching subtraction statement. In each of the groups below, finding the answer for one statement will help you find the answers for the three matching statements.

Oral For each addition or subtraction, tell the answers.

	<i>a</i>	<i>b</i>	<i>c</i>	<i>d</i>	<i>e</i>	<i>f</i>	<i>g</i>	<i>h</i>
1.	$\begin{array}{r} 9 \\ +3 \\ \hline 12 \end{array}$	$\begin{array}{r} 3 \\ +9 \\ \hline 12 \end{array}$	$\begin{array}{r} 12 \\ -3 \\ \hline 9 \end{array}$	$\begin{array}{r} 12 \\ -9 \\ \hline 3 \end{array}$	$\begin{array}{r} 5 \\ +4 \\ \hline 9 \end{array}$	$\begin{array}{r} 4 \\ +5 \\ \hline 9 \end{array}$	$\begin{array}{r} 9 \\ -4 \\ \hline 5 \end{array}$	$\begin{array}{r} 9 \\ -5 \\ \hline 4 \end{array}$
2.	$\begin{array}{r} 6 \\ +4 \\ \hline 10 \end{array}$	$\begin{array}{r} 4 \\ +6 \\ \hline 10 \end{array}$	$\begin{array}{r} 10 \\ -4 \\ \hline 6 \end{array}$	$\begin{array}{r} 10 \\ -6 \\ \hline 4 \end{array}$	$\begin{array}{r} 7 \\ +4 \\ \hline 11 \end{array}$	$\begin{array}{r} 4 \\ +7 \\ \hline 11 \end{array}$	$\begin{array}{r} 11 \\ -4 \\ \hline 7 \end{array}$	$\begin{array}{r} 11 \\ -7 \\ \hline 4 \end{array}$
3.	$\begin{array}{r} 8 \\ +4 \\ \hline 12 \end{array}$	$\begin{array}{r} 4 \\ +8 \\ \hline 12 \end{array}$	$\begin{array}{r} 12 \\ -4 \\ \hline 8 \end{array}$	$\begin{array}{r} 12 \\ -8 \\ \hline 4 \end{array}$	$\begin{array}{r} 9 \\ +4 \\ \hline 13 \end{array}$	$\begin{array}{r} 4 \\ +9 \\ \hline 13 \end{array}$	$\begin{array}{r} 13 \\ -4 \\ \hline 9 \end{array}$	$\begin{array}{r} 13 \\ -9 \\ \hline 4 \end{array}$
4.	$\begin{array}{r} 6 \\ +5 \\ \hline 11 \end{array}$	$\begin{array}{r} 5 \\ +6 \\ \hline 11 \end{array}$	$\begin{array}{r} 11 \\ -5 \\ \hline 6 \end{array}$	$\begin{array}{r} 11 \\ -6 \\ \hline 5 \end{array}$	$\begin{array}{r} 7 \\ +5 \\ \hline 12 \end{array}$	$\begin{array}{r} 5 \\ +7 \\ \hline 12 \end{array}$	$\begin{array}{r} 12 \\ -5 \\ \hline 7 \end{array}$	$\begin{array}{r} 12 \\ -7 \\ \hline 5 \end{array}$
5.	$\begin{array}{r} 8 \\ +5 \\ \hline 13 \end{array}$	$\begin{array}{r} 5 \\ +8 \\ \hline 13 \end{array}$	$\begin{array}{r} 13 \\ -5 \\ \hline 8 \end{array}$	$\begin{array}{r} 13 \\ -8 \\ \hline 5 \end{array}$	$\begin{array}{r} 9 \\ +5 \\ \hline 14 \end{array}$	$\begin{array}{r} 5 \\ +9 \\ \hline 14 \end{array}$	$\begin{array}{r} 14 \\ -5 \\ \hline 9 \end{array}$	$\begin{array}{r} 14 \\ -9 \\ \hline 5 \end{array}$
6.	$\begin{array}{r} 7 \\ +6 \\ \hline 13 \end{array}$	$\begin{array}{r} 6 \\ +7 \\ \hline 13 \end{array}$	$\begin{array}{r} 13 \\ -6 \\ \hline 7 \end{array}$	$\begin{array}{r} 13 \\ -7 \\ \hline 6 \end{array}$	$\begin{array}{r} 8 \\ +6 \\ \hline 14 \end{array}$	$\begin{array}{r} 6 \\ +8 \\ \hline 14 \end{array}$	$\begin{array}{r} 14 \\ -6 \\ \hline 8 \end{array}$	$\begin{array}{r} 14 \\ -8 \\ \hline 6 \end{array}$
7.	$\begin{array}{r} 9 \\ +6 \\ \hline 15 \end{array}$	$\begin{array}{r} 6 \\ +9 \\ \hline 15 \end{array}$	$\begin{array}{r} 15 \\ -6 \\ \hline 9 \end{array}$	$\begin{array}{r} 15 \\ -9 \\ \hline 6 \end{array}$	$\begin{array}{r} 8 \\ +7 \\ \hline 15 \end{array}$	$\begin{array}{r} 7 \\ +8 \\ \hline 15 \end{array}$	$\begin{array}{r} 15 \\ -7 \\ \hline 8 \end{array}$	$\begin{array}{r} 15 \\ -8 \\ \hline 7 \end{array}$
8.	$\begin{array}{r} 9 \\ +7 \\ \hline 16 \end{array}$	$\begin{array}{r} 7 \\ +9 \\ \hline 16 \end{array}$	$\begin{array}{r} 16 \\ -7 \\ \hline 9 \end{array}$	$\begin{array}{r} 16 \\ -9 \\ \hline 7 \end{array}$	$\begin{array}{r} 9 \\ +8 \\ \hline 17 \end{array}$	$\begin{array}{r} 8 \\ +9 \\ \hline 17 \end{array}$	$\begin{array}{r} 17 \\ -8 \\ \hline 9 \end{array}$	$\begin{array}{r} 17 \\ -9 \\ \hline 8 \end{array}$

Written Copy each addition and subtraction above. Write each answer. See above.

Checkup Time

The numerals in () tell the pages where you can turn for help if you need it.

Important Ideas

1. Knowing addition combinations will help you learn subtraction combinations. (63-64)
2. Solve a story problem by changing it into an arithmetic statement and then finding the missing number. (70)

Questions to Discuss

See T75 for answers.

1. How does knowing addition combinations help you do subtraction? (64, 66)
2. How can you use a number line to help you find the difference in a subtraction statement? (64, 65, 67)
3. How can you use a table to help you find the difference in a subtraction statement? (69)
4. What do you do with the numbers in a story problem if you are to find how many altogether? How many more? How many less? How many more are needed? How many left? (70)

Written Practice

Write each problem in the language of arithmetic and solve it. Check your work. (70, 72)

1. Peter had 4 pennies in his piggy bank. He earned 2 pennies helping his mother with the dishes. His father gave him 3 pennies more. How many pennies did he have altogether?

$$4+2+3=\square \text{ 9 pennies}$$

2. Joy received a book that held 16 photographs. She had 9 photographs. How many more did she need to fill the book?

$$16-9=\square \text{ 7 photographs}$$

3. The bakery had a sale on cakes. They had 17 cakes. In an hour they had sold 8 cakes. How many did they have left?

$$17-8=\square \text{ 9 cakes}$$

4. Twelve children came to Jim's party. At four o'clock, 5 children went home. How many children stayed?

$$12-5=\square \text{ 7 children}$$

5. Kevin read 13 library books. Larry read 9. How many fewer books did Larry read than Kevin?

$$13-9=\square \text{ 4 fewer books}$$

Part 1 Write each of these statements in column form, replacing the \square with the missing numeral.

a	b
1. $11 - 7 = \square$	$12 - 7 = \square$
2. $16 - 8 = \square$	$6 + 2 + 1 = \square$
3. $9 + 8 = \square$	$14 - 7 = \square$
4. $12 - 4 = \square$	$5 + 3 + 1 = \square$

Part 2 Copy. Write each sum or difference.

	a	b	c	d
1.	$\begin{array}{r} 8 \\ +5 \\ \hline 13 \end{array}$	$\begin{array}{r} 7 \\ +4 \\ \hline 11 \end{array}$	$\begin{array}{r} 11 \\ -4 \\ \hline 7 \end{array}$	$\begin{array}{r} 11 \\ -7 \\ \hline 4 \end{array}$
2.	$\begin{array}{r} 12 \\ -8 \\ \hline 4 \end{array}$	$\begin{array}{r} 5 \\ +8 \\ \hline 13 \end{array}$	$\begin{array}{r} 13 \\ -8 \\ \hline 5 \end{array}$	$\begin{array}{r} 9 \\ +4 \\ \hline 13 \end{array}$
3.	$\begin{array}{r} 13 \\ -7 \\ \hline 6 \end{array}$	$\begin{array}{r} 5 \\ +7 \\ \hline 12 \end{array}$	$\begin{array}{r} 12 \\ -7 \\ \hline 5 \end{array}$	$\begin{array}{r} 12 \\ -5 \\ \hline 7 \end{array}$
4.	$\begin{array}{r} 15 \\ -8 \\ \hline 7 \end{array}$	$\begin{array}{r} 12 \\ -4 \\ \hline 8 \end{array}$	$\begin{array}{r} 16 \\ -9 \\ \hline 7 \end{array}$	$\begin{array}{r} 8 \\ +8 \\ \hline 16 \end{array}$
5.	$\begin{array}{r} 16 \\ -7 \\ \hline 9 \end{array}$	$\begin{array}{r} 13 \\ -9 \\ \hline 4 \end{array}$	$\begin{array}{r} 17 \\ -9 \\ \hline 8 \end{array}$	$\begin{array}{r} 9 \\ +6 \\ \hline 15 \end{array}$
6.	$\begin{array}{r} 3 \\ 2 \\ +4 \\ \hline 9 \end{array}$	$\begin{array}{r} 6 \\ 1 \\ +1 \\ \hline 8 \end{array}$	$\begin{array}{r} 3 \\ 1 \\ +4 \\ \hline 8 \end{array}$	$\begin{array}{r} 5 \\ 1 \\ +2 \\ \hline 8 \end{array}$

Part 3 Write these problems in the language of arithmetic. Solve each problem.

1. Nan made 14 cupcakes. She took 6 of them to a friend. How many did she keep? $14 - 6 = \square$

2. Peter invited 15 boys to a party. He bought 7 favors. How many more will he need so each guest will have one? $15 - 7 = \square$

3. Nancy met Susan on the corner. A little farther on they met 2 friends. How many children were there altogether?

4. Tom had 2 marbles. He won 2 more. Then his sister gave him 3. How many did he have in all? $2 + 2 + 3 = \square$

5. Dorothy bought 12 candy bars. She and her friends ate 4 of them. How many were left? $12 - 4 = \square$

6. Paul saw 11 puppies and 7 kittens in a pet store window. How many fewer kittens were there than puppies? $11 - 7 = \square$

7. Bill had 13 marbles in his coat pocket. He gave 5 of them away. How many were left? $13 - 5 = \square$



Using Addition

Jerry wanted to find the missing number in the arithmetic statement $13 + 2 = \square$. He knew that $13 = 10 + 3$. Does $10 + 3 + 2 = 15$?

You can also add 13 and 2 as shown below.

$$\begin{array}{r} 13 \\ +2 \\ \hline \end{array}$$

$$\begin{array}{r} 1 \text{ ten and } 3 \text{ ones} \\ + \quad 2 \text{ ones} \\ \hline 1 \text{ ten and } 5 \text{ ones} \end{array}$$

$$\begin{array}{r|l} T & O \\ 1 & 3 \\ + & 2 \\ \hline 1 & 5 \end{array}$$

$$\begin{array}{r} 13 \\ +2 \\ \hline 15 \end{array}$$

Ones: 3 ones + 2 ones = 5 ones. Write 5 in the ones place in the sum.

Tens: There are no tens to be added. Write 1 in the tens place in the sum. The sum is 1 ten and 5 ones, or 15.

Oral Tell how to find the sum in each statement below. See paragraphs above.

a

$$1. \quad 3 + 2 = \square$$

b

$$13 + 2 = \square$$

c

$$23 + 2 = \square$$

$$2. \quad 4 + 3 = \square$$

$$14 + 3 = \square$$

$$24 + 3 = \square$$

Written Write the statements in 1 and 2 on place-value grids. Write each sum. See below.

1.

$\begin{array}{r l} T & O \\ 3 & \\ + & 2 \\ \hline & 5 \end{array}$	$\begin{array}{r l} T & O \\ 13 & \\ + & 2 \\ \hline 1 & 5 \end{array}$	$\begin{array}{r l} T & O \\ 23 & \\ + & 2 \\ \hline 2 & 5 \end{array}$
--	---	---

2.

$\begin{array}{r l} T & O \\ 4 & \\ + & 3 \\ \hline & 7 \end{array}$	$\begin{array}{r l} T & O \\ 14 & \\ + & 3 \\ \hline 1 & 7 \end{array}$	$\begin{array}{r l} T & O \\ 24 & \\ + & 3 \\ \hline 2 & 7 \end{array}$
--	---	---

Practice in Addition

You can use a fast way to add one-digit to two-digit numbers. Look first at the ones in both numbers. When their sum is less than ten, add them and leave the tens as they are. In $23+5=\square$, add 3 and 5. No tens are to be added. The sum is 28.

Oral Tell how knowing a helps you do b and c . See paragraph above.

a	b	c
1. $4+5=\square$	$14+5=\square$	$24+5=\square$
2. $3+4=\square$	$13+4=\square$	$23+4=\square$
3. $5+3=\square$	$15+3=\square$	$25+3=\square$

Written Copy in groups of two. Write each sum.

	a	b	c	d	e	f	g	h
1.	$\begin{array}{r} 6 \\ +2 \\ \hline 8 \end{array}$	$\begin{array}{r} 26 \\ +2 \\ \hline 28 \end{array}$	$\begin{array}{r} 3 \\ +3 \\ \hline 6 \end{array}$	$\begin{array}{r} 43 \\ +3 \\ \hline 46 \end{array}$	$\begin{array}{r} 2 \\ +4 \\ \hline 6 \end{array}$	$\begin{array}{r} 62 \\ +4 \\ \hline 66 \end{array}$	$\begin{array}{r} 4 \\ +4 \\ \hline 8 \end{array}$	$\begin{array}{r} 34 \\ +4 \\ \hline 38 \end{array}$
2.	$\begin{array}{r} 6 \\ +1 \\ \hline 7 \end{array}$	$\begin{array}{r} 96 \\ +1 \\ \hline 97 \end{array}$	$\begin{array}{r} 7 \\ +1 \\ \hline 8 \end{array}$	$\begin{array}{r} 77 \\ +1 \\ \hline 78 \end{array}$	$\begin{array}{r} 5 \\ +4 \\ \hline 9 \end{array}$	$\begin{array}{r} 35 \\ +4 \\ \hline 39 \end{array}$	$\begin{array}{r} 2 \\ +5 \\ \hline 7 \end{array}$	$\begin{array}{r} 62 \\ +5 \\ \hline 67 \end{array}$
3.	$\begin{array}{r} 2 \\ +5 \\ \hline 7 \end{array}$	$\begin{array}{r} 42 \\ +5 \\ \hline 47 \end{array}$	$\begin{array}{r} 1 \\ +6 \\ \hline 7 \end{array}$	$\begin{array}{r} 81 \\ +6 \\ \hline 87 \end{array}$	$\begin{array}{r} 3 \\ +6 \\ \hline 9 \end{array}$	$\begin{array}{r} 53 \\ +6 \\ \hline 59 \end{array}$	$\begin{array}{r} 3 \\ +4 \\ \hline 7 \end{array}$	$\begin{array}{r} 73 \\ +4 \\ \hline 77 \end{array}$

Copy. Write each sum.

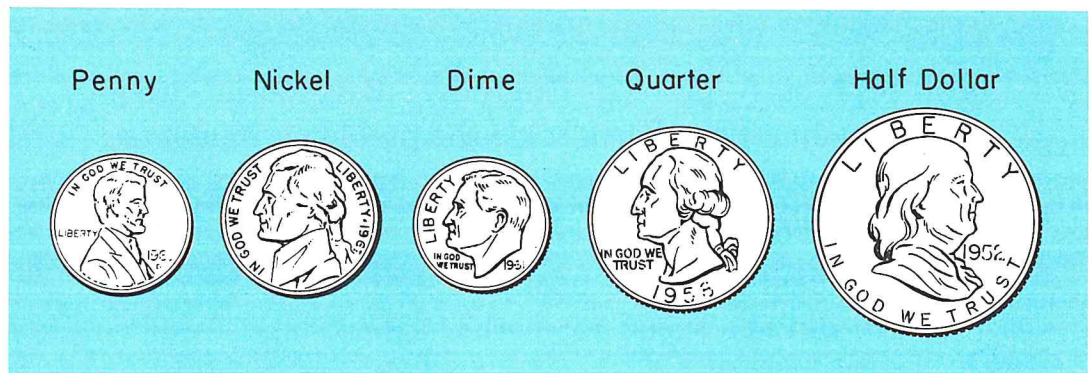
	a	b	c	d	e	f	g	h	i
1.	$\begin{array}{r} 3 \\ +2 \\ \hline 5 \end{array}$	$\begin{array}{r} 13 \\ +2 \\ \hline 15 \end{array}$	$\begin{array}{r} 23 \\ +2 \\ \hline 25 \end{array}$	$\begin{array}{r} 33 \\ +2 \\ \hline 35 \end{array}$	$\begin{array}{r} 43 \\ +2 \\ \hline 45 \end{array}$	$\begin{array}{r} 63 \\ +2 \\ \hline 65 \end{array}$	$\begin{array}{r} 73 \\ +2 \\ \hline 75 \end{array}$	$\begin{array}{r} 83 \\ +2 \\ \hline 85 \end{array}$	$\begin{array}{r} 93 \\ +2 \\ \hline 95 \end{array}$
2.	$\begin{array}{r} 3 \\ +5 \\ \hline 8 \end{array}$	$\begin{array}{r} 13 \\ +5 \\ \hline 18 \end{array}$	$\begin{array}{r} 33 \\ +5 \\ \hline 38 \end{array}$	$\begin{array}{r} 63 \\ +5 \\ \hline 68 \end{array}$	$\begin{array}{r} 53 \\ +5 \\ \hline 58 \end{array}$	$\begin{array}{r} 83 \\ +5 \\ \hline 88 \end{array}$	$\begin{array}{r} 43 \\ +5 \\ \hline 48 \end{array}$	$\begin{array}{r} 93 \\ +5 \\ \hline 98 \end{array}$	$\begin{array}{r} 73 \\ +5 \\ \hline 78 \end{array}$

Read each story problem carefully. Pay special attention to the question. Then solve the problem. *Reminder:* You are to add the numbers if the groups, or sets, are to be put together.

1. Mary spent 83¢ for a book and 4¢ for a cooky. How much did she spend for both? $83+4=\square$ 87¢
2. Joan has worked 11 of her arithmetic problems. She has 7 more to do. How many problems will she do altogether? $11+7=\square$ 18 problems
3. Bob had 15 pieces of candy. He bought 4 more pieces of candy. How many did he have then?
 $15+4=\square$ 19 pieces
4. Tom counted 63 stars in the sky. Then he counted 4 more. How many stars did he count altogether?
 $63+4=\square$ 67 stars
5. There were 22 airplanes on the field. 6 more airplanes landed. Then how many planes were on the field altogether? $22+6=\square$ 28 planes
6. 5 boats were tied up at the wharf. At sunset 14 more boats came in and were tied to the wharf. How many boats in all were tied to the wharf? $5+14=\square$ 19 boats
7. Ann placed 3 candles on her sister's birthday cake. Later Mother added 13 more candles. How many candles were there in all? $3+13=\square$ 16 candles

A quick review

- | a | b | c |
|---------------------|------------------|------------------|
| 1. $8+7=\square$ 15 | $15-7=\square$ 8 | $15-8=\square$ 7 |
| 2. $6+7=\square$ 13 | $13-7=\square$ 6 | $13-6=\square$ 7 |
| 3. $9+7=\square$ 16 | $16-7=\square$ 9 | $16-9=\square$ 7 |



Using Money

Look at the pictures of the coins above. You can buy as much of anything with a nickel as with 5 pennies. Thus a nickel is equal in value to 5 pennies. Is a dime equal in value to 10 pennies? How many pennies are equal in value to a quarter? To a half dollar?

Other coins that are equal in value are shown below.

1 dime = 2 nickels 1 quarter = 5 nickels	1 half dollar = 10 nickels 1 half dollar = 5 dimes
---	---

Oral Tell at least two ways to do the following.

Representative answers are given.

1. Make change for a quarter using dimes and nickels.
2 dimes, 1 nickel; 1 dime, 3 nickels
2. Make change for a half dollar using two dimes and other coins. *2 dimes, 1 nickel, 1 quarter; 2 dimes, 5 nickels, 5 pennies; 2 dimes, 6 nickels*

Written Copy. Replace each with the numeral that makes the coins equal in value.

1. 1 dime = 1 nickel and 5 pennies.
2. 1 quarter = 2 dimes and 1 nickel.
3. 1 half dollar = 1 quarter, 2 dimes, and 1 nickel.
4. 1 quarter = 15 pennies and 2 nickels.

Adding Numbers That Stand for Money

Jane had a dime and Mary had 5 pennies. How much money did the girls have together?

You know that a dime has the same value as 10 pennies. Together, the girls had money with a value of 15 pennies, or 15 cents.

In column form, the arithmetic statement for the problem can be written as in A. On the grid there is a place for cents and a place for dimes. Add the digits as you add ones and tens as in B. The sum is 1 dime and 5 cents which is equal in value to 15 cents.

	Dimes	Cents		T	C
A	1	0		1	0
	+	5	B	+	5
		5			5

Oral Tell how you would find the sums in rows 1 and 2. Tell the sums and where to write the sign ¢. See paragraphs above.

	a	b	c	d	e	f	g
1.	12¢ +7¢ 19¢	9¢ +10¢ 19¢	16¢ +3¢ 19¢	13¢ +4¢ 17¢	10¢ +8¢ 18¢	15¢ +3¢ 18¢	10¢ +5¢ 15¢
2.	72¢ +5¢ 77¢	9¢ +80¢ 89¢	26¢ +2¢ 28¢	11¢ +8¢ 19¢	34¢ +2¢ 36¢	13¢ +3¢ 16¢	81¢ +4¢ 85¢
3.	30¢ +6¢ 36¢	6¢ +22¢ 28¢	61¢ +3¢ 64¢	35¢ +4¢ 39¢	45¢ +4¢ 49¢	25¢ +4¢ 29¢	50¢ +9¢ 59¢
4.	21¢ +6¢ 27¢	4¢ +21¢ 25¢	12¢ +6¢ 18¢	42¢ +6¢ 48¢	20¢ +9¢ 29¢	31¢ +8¢ 39¢	54¢ +3¢ 57¢
5.	32¢ +3¢ 35¢	46¢ +2¢ 48¢	57¢ +2¢ 59¢	22¢ +7¢ 29¢	41¢ +6¢ 47¢	16¢ +3¢ 19¢	21¢ +8¢ 29¢

Written Copy 1 through 5 above. Write each sum.

See above.

Remembering a Ten

Sally has a collection of 16 shells and Ann has a collection of 7 shells. If they put their collections together, how many shells will they have?

The shells are to be thought of as being put together, so you add the numbers. The arithmetic statement is $16+7=\square$. In column form the statement can be written as in A. Use B and C to discover how to add 7 to 16.

A

$$\begin{array}{r} 16 \\ +7 \\ \hline \end{array}$$

B

C

T	O
1	6
+	7
2	3

D

$$\begin{array}{r} 16 \\ +7 \\ \hline 23 \end{array}$$

The addition can also be shown on a grid as in C. Add this way:

Ones: 6 ones + 7 ones = 13 ones. Change the form of 13 ones to 1 ten and 3 ones. Write 3 in the ones place in the sum. Remember 1 ten. (In the grid the little numeral 1 in the tens place is a reminder.)

Tens: 1 ten remembered + 1 ten = 2 tens. Write 2 in the tens place. The sum is 2 tens and 3 ones, or 23.

Oral Be ready to tell how you would find the sum in each addition below. See paragraphs above.

<i>a</i>	<i>b</i>	<i>c</i>	<i>d</i>	<i>e</i>	<i>f</i>	<i>g</i>	<i>h</i>
15	17	18	19	15	17	13	14
+9	+6	+5	+6	+5	+7	+9	+8
24	23	23	25	20	24	22	22

Written Copy *a* through *h* above. Write each sum.

See above.

Adding in Another Way

Do you remember the combinations for 10? Did you think of $1 + 9$? $9 + 1$? $2 + 8$? $8 + 2$? What are the others? See how these combinations are used below.

$$27 + 3 = \square \quad \text{becomes } 20 + 7 + 3, \text{ or } 20 + 10, \text{ or } 30$$

$$38 + 2 = \square \quad \text{becomes } 30 + 8 + 2, \text{ or } 30 + 10, \text{ or } 40$$

$$49 + 1 = \square \quad \text{becomes } 40 + 9 + 1, \text{ or } 40 + 10, \text{ or } 50$$

You can use combinations of 10 in this addition:
 $38 + 7 = \square$. Think of the 7 as $2 + 5$. Then the addition becomes $38 + 2 + 5$, or $40 + 5$, or 45.

How could you use a combination of 10 when adding 8 to 38? 9 to 39?

Oral Read. Replace each \square with a number word.

- | | | |
|----------------------|--------------------|--------------------|
| a fourteen | b twenty-four | c thirty-four |
| 1. $8 + 6 = \square$ | $18 + 6 = \square$ | $28 + 6 = \square$ |
| d twelve | e twenty-two | f thirty-two |
| 2. $3 + 9 = \square$ | $13 + 9 = \square$ | $23 + 9 = \square$ |

Written Copy. Write each sum.

- | | a | b | c | d | e | f | g | h |
|----|--|--|--|--|--|--|--|--|
| 1. | $\begin{array}{r} 7 \\ +8 \\ \hline 15 \end{array}$ | $\begin{array}{r} 17 \\ +8 \\ \hline 25 \end{array}$ | $\begin{array}{r} 27 \\ +8 \\ \hline 35 \end{array}$ | $\begin{array}{r} 37 \\ +8 \\ \hline 45 \end{array}$ | $\begin{array}{r} 8 \\ +6 \\ \hline 14 \end{array}$ | $\begin{array}{r} 18 \\ +6 \\ \hline 24 \end{array}$ | $\begin{array}{r} 28 \\ +6 \\ \hline 34 \end{array}$ | $\begin{array}{r} 38 \\ +6 \\ \hline 44 \end{array}$ |
| 2. | $\begin{array}{r} 4 \\ +6 \\ \hline 10 \end{array}$ | $\begin{array}{r} 14 \\ +6 \\ \hline 20 \end{array}$ | $\begin{array}{r} 24 \\ +6 \\ \hline 30 \end{array}$ | $\begin{array}{r} 34 \\ +6 \\ \hline 40 \end{array}$ | $\begin{array}{r} 3 \\ +9 \\ \hline 12 \end{array}$ | $\begin{array}{r} 13 \\ +9 \\ \hline 22 \end{array}$ | $\begin{array}{r} 23 \\ +9 \\ \hline 32 \end{array}$ | $\begin{array}{r} 33 \\ +9 \\ \hline 42 \end{array}$ |
| 3. | $\begin{array}{r} 38 \\ +7 \\ \hline 45 \end{array}$ | $\begin{array}{r} 42 \\ +9 \\ \hline 51 \end{array}$ | $\begin{array}{r} 75 \\ +5 \\ \hline 80 \end{array}$ | $\begin{array}{r} 88 \\ +6 \\ \hline 94 \end{array}$ | $\begin{array}{r} 66 \\ +8 \\ \hline 74 \end{array}$ | $\begin{array}{r} 87 \\ +4 \\ \hline 91 \end{array}$ | $\begin{array}{r} 59 \\ +8 \\ \hline 67 \end{array}$ | $\begin{array}{r} 34 \\ +7 \\ \hline 41 \end{array}$ |



Should You Add or Subtract?

Read each of the following story problems. Find out what story is told. Pay special attention to the question. Add the numbers if the groups, or sets, are to be put together. Subtract the numbers if a group, or set, is to be taken apart, or if you are to find by how many one set differs from another.

Oral Tell whether you would add or subtract to solve each problem below. Tell how you decided.

1. Dick spent 75¢ for a dog dish and 6¢ for a bag of candy. How much did he spend in all? **Add; sets are joined** $75+6=\square$ 81¢
2. Janet bought a stamp for 3¢, a pencil for 4¢, and paper for 8¢. How much money did she spend? **Add; sets are joined** $3+4+8=\square$ 15¢
3. Carol spent 46¢ for a toothbrush and 7¢ for some candy. How much did she spend for both? **Add; sets are joined** $46+7=\square$ 53¢
4. Judy may invite 16 friends to her party. She has invited 7. How many more may she invite? **Subtract; sets are compared** $16-7=\square$ 9 friends
5. Jerry saved 14¢ last week and 8¢ this week. How much money did he save in two weeks? **Add; sets are joined** $14+8=\square$ 22¢
6. Nancy is reading a story 17 pages long. She has read 8 pages. How many pages has she yet to read? **Subtract; a set is taken apart** $17-8=\square$ 9 pages

Written Solve problems 1 through 6. Write each answer. Check your work. **See above.**

Practice in Addition and Subtraction

Spend time learning addition and subtraction combinations you do not know. Using your practice cards will help you learn them.

Oral See how quickly you can think and say each sum or difference for each statement below.

- | <i>a</i> | <i>b</i> | <i>c</i> | <i>d</i> |
|---------------------------------|-----------------------------|-----------------------------|-----------------------------|
| 1. $1+9=\square$ ¹⁰ | $10-9=\square$ ¹ | $5+6=\square$ ¹¹ | $11-6=\square$ ⁵ |
| 2. $7+7=\square$ ¹⁴ | $14-7=\square$ ⁷ | $2+9=\square$ ¹¹ | $11-9=\square$ ² |
| 3. $3+9=\square$ ¹² | $12-9=\square$ ³ | $5+7=\square$ ¹² | $12-7=\square$ ⁵ |
| 4. $6+8=\square$ ¹⁴ | $14-8=\square$ ⁶ | $4+9=\square$ ¹³ | $13-9=\square$ ⁴ |
| 5. $8+7=\square$ ¹⁵ | $15-7=\square$ ⁸ | $9+8=\square$ ¹⁷ | $17-8=\square$ ⁹ |
| 6. $9+7=\square$ ¹⁶ | $16-7=\square$ ⁹ | $5+9=\square$ ¹⁴ | $14-9=\square$ ⁵ |
| 7. $6+9=\square$ ¹⁵ | $15-9=\square$ ⁶ | $3+8=\square$ ¹¹ | $11-8=\square$ ³ |
| 8. $7+9=\square$ ¹⁶ | $16-9=\square$ ⁷ | $4+7=\square$ ¹¹ | $11-7=\square$ ⁴ |
| 9. $9+9=\square$ ¹⁸ | $18-9=\square$ ⁹ | $8+9=\square$ ¹⁷ | $17-9=\square$ ⁸ |
| 10. $4+8=\square$ ¹² | $12-8=\square$ ⁴ | $3+7=\square$ ¹⁰ | $10-7=\square$ ³ |
| 11. $7+8=\square$ ¹⁵ | $15-8=\square$ ⁷ | $6+7=\square$ ¹³ | $13-7=\square$ ⁶ |
| 12. $8+8=\square$ ¹⁶ | $16-8=\square$ ⁸ | $5+8=\square$ ¹³ | $13-8=\square$ ⁵ |
| 13. $8+6=\square$ ¹⁴ | $14-6=\square$ ⁸ | $9+6=\square$ ¹⁵ | $15-6=\square$ ⁹ |
| 14. $6+6=\square$ ¹² | $12-6=\square$ ⁶ | $7+6=\square$ ¹³ | $13-6=\square$ ⁷ |

Written Write each statement above in column form. Replace each \square with the missing numeral. See above.

	1	2	3	4	5	6	7	8	9	R	H	E
VISITORS	0	0	0	0	0	0	0					
HOME	3	1	2	2	0	0	0					

Adding Numbers in Columns

In a ball game our side made 3 runs in its first turn at bat, 1 run in its second turn, 2 runs in its third turn, and 2 runs in its fourth. How many runs did our side make altogether?

Because you are to find a number equal to all of the runs together, you add the numbers. Write the statement in the language of arithmetic, $3+1+2+2=\square$. You can add like this: $3+1=4$. Remember the 4. $4+2=6$. Remember the 6. $6+2=8$. Write 8 in the sum. The addition can also be written in column form as shown at the right.

To check your addition, you can add the numbers again in any different order. You should get the same sum as you did at first. Does changing the order in which you add numbers change the sum?

$$\begin{array}{r} 3 \\ 1 \\ 2 \\ +2 \\ \hline 8 \end{array}$$

Oral Read. Tell each sum.

	<i>a</i>	<i>b</i>	<i>c</i>	<i>d</i>	<i>e</i>	<i>f</i>	<i>g</i>	<i>h</i>
1.	1 3 3 +2 <hr/> 9	3 1 1 +1 <hr/> 6	1 2 0 +6 <hr/> 9	1 2 3 +1 <hr/> 7	2 2 2 +1 <hr/> 7	3 1 2 +2 <hr/> 8	1 2 2 +1 <hr/> 6	5 2 0 +1 <hr/> 8
2.	4 1 2 +2 <hr/> 9	2 3 2 +1 <hr/> 8	3 2 2 +2 <hr/> 9	5 1 2 +1 <hr/> 9	6 1 1 +1 <hr/> 9	1 3 0 +5 <hr/> 9	1 6 0 +2 <hr/> 9	6 0 0 +3 <hr/> 9

Written Copy. Write each sum. Add down. Check.
See above.

A New Step in Column Addition

Sometimes you need to add in statements such as $51+3+4=\square$. You can do this if you will use what you have learned about adding. *Reminder:* You can add only 2 numbers at a time.

$$\begin{array}{r} 51 \\ 3 \\ +4 \\ \hline \end{array}$$

$$\begin{array}{r} 5 \text{ tens and } 1 \text{ one} \\ 3 \text{ ones} \\ + 4 \text{ ones} \\ \hline 5 \text{ tens and } 8 \text{ ones, or } 58 \end{array}$$

$$\begin{array}{r|l} T & O \\ 51 & 3 \\ +4 & \\ \hline 58 & \end{array}$$

Ones: 1 one + 3 ones = 4 ones. Remember 4 ones.
4 ones + 4 ones = 8 ones. Write 8 in the ones place.

Tens: There are no tens to add to the 5 tens. Write 5 in the tens place. The sum is 5 tens and 8 ones, or 58.

Oral Be ready to show how you add in row 1. Tell the sums. See paragraphs above.

	<i>a</i>	<i>b</i>	<i>c</i>	<i>d</i>	<i>e</i>	<i>f</i>	<i>g</i>	<i>h</i>
1.	82 4 +1 <u>87</u>	2 71 +4 <u>77</u>	5 21 +3 <u>29</u>	6 3 +20 <u>29</u>	72 4 +3 <u>79</u>	31 3 +2 <u>36</u>	40 3 +4 <u>47</u>	5 2 +91 <u>98</u>
2.	2 64 +2 <u>68</u>	3 1 +90 <u>94</u>	2 43 +2 <u>47</u>	2 4 +20 <u>26</u>	2 4 +31 <u>37</u>	5 1 +30 <u>36</u>	71 3 +1 <u>75</u>	3 4 +60 <u>67</u>
3.	22 2 +2 <u>26</u>	13 2 +3 <u>18</u>	6 60 +2 <u>68</u>	5 2 +50 <u>57</u>	1 21 +7 <u>29</u>	1 5 +23 <u>29</u>	24 3 +1 <u>28</u>	5 2 +51 <u>58</u>

Written Copy 1 through 3 above. Write each sum.
Check by adding in a different order. See above.

More About Column Addition

Jean counted 6 clowns at the front of the parade, 5 clowns at the side, and 3 clowns at the end of the parade. How many clowns did Jean count altogether?

The clowns must be thought of as being put together, so you should add. In the language of arithmetic the statement is $6+5+3=\square$. In column form the statement is written as in A. Then add as in B: 6 ones + 5 ones = 11 ones. Remember 11 ones. 11 ones + 3 ones = 14 ones, or 1 ten and 4 ones. Write 4 in the ones place in the sum. Write 1 in the tens place in the sum. You can see that the sum is 1 ten and 4 ones, or 14.

A	B
You see:	You think:
$\begin{array}{r} 6 \\ 5 \\ +3 \\ \hline \end{array}$	$\begin{array}{r} 6 \\ +5 \\ \hline 11 \end{array} \rightarrow \begin{array}{r} 11 \\ +3 \\ \hline 14 \end{array}$

Oral Read. Tell how to find each sum in row 1.

See paragraphs above.

	a	b	c	d	e	f	g	h
1.	$\begin{array}{r} 9 \\ 2 \\ +3 \\ \hline 14 \end{array}$	$\begin{array}{r} 8 \\ 6 \\ +3 \\ \hline 17 \end{array}$	$\begin{array}{r} 6 \\ 5 \\ +3 \\ \hline 14 \end{array}$	$\begin{array}{r} 6 \\ 7 \\ +2 \\ \hline 15 \end{array}$	$\begin{array}{r} 9 \\ 5 \\ +1 \\ \hline 15 \end{array}$	$\begin{array}{r} 4 \\ 9 \\ +5 \\ \hline 18 \end{array}$	$\begin{array}{r} 5 \\ 8 \\ +3 \\ \hline 16 \end{array}$	$\begin{array}{r} 3 \\ 8 \\ +4 \\ \hline 15 \end{array}$
2.	$\begin{array}{r} 8 \\ 4 \\ +2 \\ \hline 14 \end{array}$	$\begin{array}{r} 6 \\ 8 \\ +4 \\ \hline 18 \end{array}$	$\begin{array}{r} 9 \\ 6 \\ +2 \\ \hline 17 \end{array}$	$\begin{array}{r} 5 \\ 9 \\ +2 \\ \hline 16 \end{array}$	$\begin{array}{r} 6 \\ 9 \\ +3 \\ \hline 18 \end{array}$	$\begin{array}{r} 4 \\ 8 \\ +3 \\ \hline 15 \end{array}$	$\begin{array}{r} 7 \\ 5 \\ +4 \\ \hline 16 \end{array}$	$\begin{array}{r} 8 \\ 5 \\ +6 \\ \hline 19 \end{array}$
3.	$\begin{array}{r} 8 \\ 0 \\ +2 \\ \hline 10 \end{array}$	$\begin{array}{r} 3 \\ 5 \\ +6 \\ \hline 14 \end{array}$	$\begin{array}{r} 3 \\ 6 \\ +7 \\ \hline 16 \end{array}$	$\begin{array}{r} 6 \\ 4 \\ +7 \\ \hline 17 \end{array}$	$\begin{array}{r} 7 \\ 4 \\ +4 \\ \hline 15 \end{array}$	$\begin{array}{r} 8 \\ 3 \\ +5 \\ \hline 16 \end{array}$	$\begin{array}{r} 6 \\ 6 \\ +6 \\ \hline 18 \end{array}$	$\begin{array}{r} 7 \\ 6 \\ +3 \\ \hline 16 \end{array}$

Written Copy 1 through 3. Write each sum. Check.
See above.

Remembering a Ten in Column Addition

Bill had 25 marbles, Jerry gave him 6 marbles, and he bought 7. How many marbles did he have then?

Remember the things you have learned about adding. Use the picture to discover how to solve $25+6+7=\square$.

$$\begin{array}{r} 25 \\ 6 \\ +7 \\ \hline \end{array}$$

$$\begin{array}{r} \overset{1}{\leftarrow} \\ 2 \text{ tens and } 5 \text{ ones} \\ + \quad \quad 6 \text{ ones} \\ \quad \quad 7 \text{ ones} \\ \hline 3 \text{ tens and } 18 \text{ ones} \end{array}$$

$$\begin{array}{r} \text{T} | \text{O} \\ 25 \\ 6 \\ +7 \\ \hline 38 \end{array}$$

$$\begin{array}{r} 25 \\ 6 \\ +7 \\ \hline 38 \end{array}$$

Ones: 5 ones + 6 ones = 11 ones. 11 ones + 7 ones = 18 ones. 18 = 1 ten and 8 ones. Remember the 1 ten. Write 8 in the ones place in the sum.

Tens: 1 ten remembered + 2 tens = 3 tens. Write 3 in the tens place in the sum. The sum is 38.

Oral Tell how to find the sums in rows 1 and 2.

See paragraphs above.

	a	b	c	d	e	f	g	h
1.	$\begin{array}{r} 66 \\ 3 \\ +5 \\ \hline 74 \end{array}$	$\begin{array}{r} 3 \\ 8 \\ +22 \\ \hline 33 \end{array}$	$\begin{array}{r} 69 \\ 8 \\ +1 \\ \hline 78 \end{array}$	$\begin{array}{r} 77 \\ 2 \\ +5 \\ \hline 84 \end{array}$	$\begin{array}{r} 27 \\ 8 \\ +4 \\ \hline 39 \end{array}$	$\begin{array}{r} 14 \\ 7 \\ +7 \\ \hline 28 \end{array}$	$\begin{array}{r} 6 \\ 35 \\ +8 \\ \hline 49 \end{array}$	$\begin{array}{r} 7 \\ 9 \\ +43 \\ \hline 59 \end{array}$
2.	$\begin{array}{r} 2 \\ 6 \\ +19 \\ \hline 27 \end{array}$	$\begin{array}{r} 9 \\ 30 \\ +8 \\ \hline 47 \end{array}$	$\begin{array}{r} 8 \\ 44 \\ +5 \\ \hline 57 \end{array}$	$\begin{array}{r} 36 \\ 6 \\ +6 \\ \hline 48 \end{array}$	$\begin{array}{r} 27 \\ 4 \\ +6 \\ \hline 37 \end{array}$	$\begin{array}{r} 74 \\ 7 \\ +8 \\ \hline 89 \end{array}$	$\begin{array}{r} 35 \\ 4 \\ +1 \\ \hline 40 \end{array}$	$\begin{array}{r} 5 \\ 45 \\ +6 \\ \hline 56 \end{array}$
3.	$\begin{array}{r} 2 \\ 9 \\ +57 \\ \hline 68 \end{array}$	$\begin{array}{r} 7 \\ 3 \\ +11 \\ \hline 21 \end{array}$	$\begin{array}{r} 4 \\ 12 \\ +5 \\ \hline 21 \end{array}$	$\begin{array}{r} 38 \\ 2 \\ +1 \\ \hline 41 \end{array}$	$\begin{array}{r} 25 \\ 7 \\ +2 \\ \hline 34 \end{array}$	$\begin{array}{r} 3 \\ 14 \\ +4 \\ \hline 21 \end{array}$	$\begin{array}{r} 5 \\ 11 \\ +6 \\ \hline 22 \end{array}$	$\begin{array}{r} 4 \\ 13 \\ +8 \\ \hline 25 \end{array}$

Written Copy rows 1 through 3. Write each sum.
See above.

MORE PRACTICE
PAGE 305

Should You Add or Subtract?

Read the following problems carefully. See if you can do them by yourself.

Written Solve problems 1 through 9. Write your answers. Check your work.

1. Last week Alice put 26¢, 7¢, and 2¢ into her bank. How much money did she put in her bank last week?
 $26+7+2=\square$ 35¢
2. John has 16¢. His brother has 7¢. How much more money has John than his brother? $16-7=\square$ 9¢
3. Jane had 40¢ in her bank, 8¢ in her pocket, and 3¢ in her desk. How much money did she have? $40+8+3=\square$
51¢
4. Peggy is 9 years old. Her brother is 17 years old. How much younger is Peggy than her brother?
 $17-9=\square$ 8 years
5. Jerry caught 6 fish, Tom caught 3, and Jim caught 5. How many fish did the three boys catch? $6+3+5=\square$
14 fish
6. At Sandra's party there were 11 girls and 7 boys. How many children went to the party? $11+7=\square$ 18 children
7. If you had 15 toy ships and traded 6 of them for marbles, how many toy ships would you still have?
 $15-6=\square$ 9 toy ships
8. At lunch Tim spent 16¢ for a sandwich and 7¢ for a bottle of milk. How much did he spend for both?
 $16+7=\square$ 23¢
9. Mary has 18 pencils, 7 crayons, and 3 erasers in her pencil box. How many objects in all are in the box?
 $18+7+3=\square$ 28 objects

Something to do Make a book of problems that you have had to solve while you were doing things outside of class. Be ready to read some of your problems to the class.

Checkup Time

The numerals in () tell the pages where you can turn for help if you need it.

Important Ideas

- When you add one-digit numbers to two-digit numbers, add the ones, then add the tens. (77, 78, 87)
- You can add a one-digit number and a two-digit number in more than one way. (78, 83)
- Numerals that stand for money have a place for dimes and a place for cents. (81)
- In addition, when the sum of the ones is 10 or more, remember the ten and add it to the tens. (82, 89)

4. How would you write numerals that stand for dimes and cents? (81)

5. What steps do you follow when you add in statement A at the right? (82)

6. What steps do you follow when you add in statement B at the right? (88)

7. What steps do you follow when you add in statement C at the right? (89)

A

17

+8

25

B

6

7

+4

17

C

26

5

+4

35

Questions to Discuss

See T91 for answers.

- What steps do you follow when you add in the statement at the right? (77)
- How can you add the numbers named above in one step?(78)
- What combinations of coins are equal in value to a dime? A quarter? Seventeen cents? (80)

34

+3

37

Written Practice

Solve problems 1 and 2. (79, 84)

1. Susan counted 17 cars going south. She counted 5 cars going north. How many cars did she count altogether? 17+5=□ 22 cars

2. Mary bought a notebook for 26¢, a pencil for 5¢, and an eraser for 4¢. How much money did she spend altogether?

26+5+4=□ 35¢

Self-Evaluation

Part 1 Copy. Write each sum or difference. Watch the signs.

	<i>a</i>	<i>b</i>	<i>c</i>	<i>d</i>
1.	$\begin{array}{r} 7 \\ +5 \\ \hline 12 \end{array}$	$\begin{array}{r} 6 \\ +8 \\ \hline 14 \end{array}$	$\begin{array}{r} 17 \\ -9 \\ \hline 8 \end{array}$	$\begin{array}{r} 15 \\ -4 \\ \hline 11 \end{array}$
2.	$\begin{array}{r} 3 \\ 2 \\ +0 \\ \hline 5 \end{array}$	$\begin{array}{r} 5 \\ 1 \\ +3 \\ \hline 9 \end{array}$	$\begin{array}{r} 2 \\ 4 \\ +3 \\ \hline 9 \end{array}$	$\begin{array}{r} 7 \\ 0 \\ +2 \\ \hline 9 \end{array}$
3.	$\begin{array}{r} 6 \\ 1 \\ 0 \\ +1 \\ \hline 8 \end{array}$	$\begin{array}{r} 3 \\ 2 \\ 0 \\ +2 \\ \hline 7 \end{array}$	$\begin{array}{r} 5 \\ 0 \\ 8 \\ +2 \\ \hline 15 \end{array}$	$\begin{array}{r} 6 \\ 5 \\ 3 \\ +0 \\ \hline 14 \end{array}$
4.	$\begin{array}{r} 26 \\ +2 \\ \hline 28 \end{array}$	$\begin{array}{r} 41 \\ +5 \\ \hline 46 \end{array}$	$\begin{array}{r} 37 \\ +1 \\ \hline 38 \end{array}$	$\begin{array}{r} 82 \\ +4 \\ \hline 86 \end{array}$
5.	$\begin{array}{r} 57 \\ +6 \\ \hline 63 \end{array}$	$\begin{array}{r} 38 \\ +5 \\ \hline 43 \end{array}$	$\begin{array}{r} 88 \\ +4 \\ \hline 92 \end{array}$	$\begin{array}{r} 63 \\ +8 \\ \hline 71 \end{array}$
6.	$\begin{array}{r} 43 \\ 2 \\ +1 \\ \hline 46 \end{array}$	$\begin{array}{r} 62 \\ 5 \\ +2 \\ \hline 69 \end{array}$	$\begin{array}{r} 7 \\ 39 \\ +1 \\ \hline 47 \end{array}$	$\begin{array}{r} 6 \\ 8 \\ +23 \\ \hline 37 \end{array}$
7.	$\begin{array}{r} 10¢ \\ +6¢ \\ \hline 16¢ \end{array}$	$\begin{array}{r} 27¢ \\ +6¢ \\ \hline 33¢ \end{array}$	$\begin{array}{r} 42¢ \\ +5¢ \\ \hline 47¢ \end{array}$	$\begin{array}{r} 58¢ \\ +7¢ \\ \hline 65¢ \end{array}$

Part 2 Copy. Write the name of each number. The first one has been done for you.

<i>a</i>	<i>b</i>
2 addend	6 minuend
+3 addend	-2 subtrahend
5 sum	4 difference

Part 3 Solve these problems.

1. Susan saw 7 sheep and 2 cows in a pasture. How many animals did she see altogether?

$$7+2=\square \quad 9 \text{ animals}$$

2. Tom spent 6¢ on candy, 5¢ on ice cream, and 2¢ on gum. How much money did he spend altogether?

$$6+5+2=\square \quad 13¢$$

3. Jack's brother Paul is 6 years old. In how many years will Paul be 15 years old?

$$15-6=\square \quad 9 \text{ years}$$

4. There were 22 children in the fourth grade. 9 new children joined the fourth grade in October. How many children were there in all?

$$22+9=\square$$

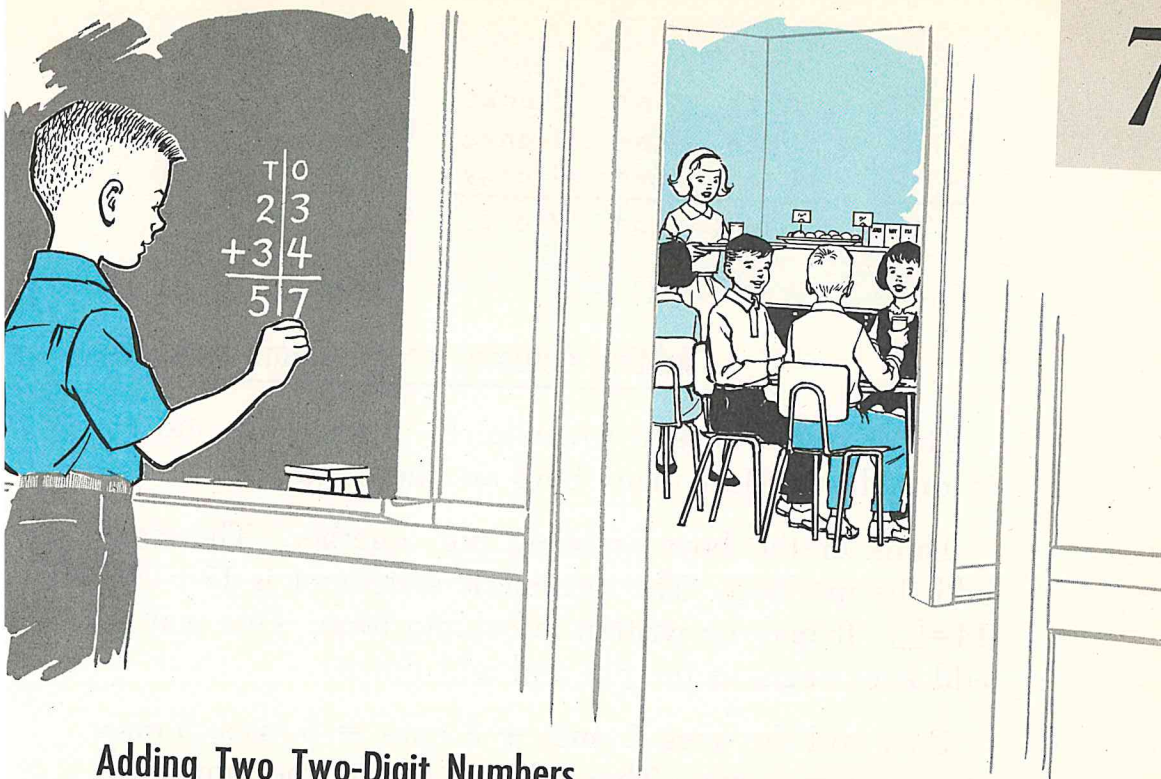
31 children

5. Peter collected 37 kinds of rocks. Susan gave him 4 more. Later he found 3 other new rocks. How many rocks did Peter have in all?

$$37+4+3=\square \quad 44 \text{ rocks}$$

6. 5 children got on the school bus. They found 26 children already seated on the bus. Later 4 more children got on the bus. How many children in all were on the bus?

$$5+26+4=\square \quad 35 \text{ children}$$



Adding Two Two-Digit Numbers

Bob counted 23 girls and 34 boys in the cafeteria. How many children in all were in the cafeteria?

You are to think of the girls and boys as being put together, so you add the numbers. Look at the work on the board in the picture above. It shows that you can add tens just as you add ones. Bob counted 57 children in the cafeteria.

Oral Be ready to tell how you would find the sum in each addition below. *Add ones, add tens*

<i>a</i>	<i>b</i>	<i>c</i>	<i>d</i>	<i>e</i>	<i>f</i>	<i>g</i>
75	26	18	26	35	55	65
+14	+33	+40	+42	+60	+22	+33
<u>89</u>	<u>59</u>	<u>58</u>	<u>68</u>	<u>95</u>	<u>77</u>	<u>98</u>

Written Copy *a* through *g* above. Write each sum.

See above.

12	1 ten	and	2 ones
13	1 ten	and	3 ones
+14	+1 ten	and	4 ones
<hr/>			
	3 tens	and	9 ones

T	O	
1	2	12
1	3	13
+1	4	+14
<hr/>		
3	9	39

Adding Columns of Two-Digit Numbers

There are 12 boys in row one, 13 in row two, and 14 in row three. How many boys are there altogether?

Think of the boys as being put together. Therefore add the numbers. The arithmetic statement is $12+13+14=\square$. It may be written in column form. One way to add is to begin at the top and add down.

First add the ones. 2 ones + 3 ones = 5 ones; 5 ones + 4 ones = 9 ones. Then add the tens in the same way. The sum is 3 tens and 9 ones, or 39.

Oral For each column addition, tell the sum.

<i>a</i>	<i>b</i>	<i>c</i>	<i>d</i>	<i>e</i>	<i>f</i>	<i>g</i>
33	24	36	15	11	10	40
+21	+50	+12	32	47	10	40
<hr/>	<hr/>	<hr/>	+51	+31	+60	+11
54	74	48	98	89	80	91

Written Copy. Write each sum. Add down. Check.

	<i>a</i>	<i>b</i>	<i>c</i>	<i>d</i>	<i>e</i>	<i>f</i>	<i>g</i>
1.	10	14	51	34	22	23	21
	25	51	23	22	42	42	21
	+24	+33	+12	+23	+12	+34	+37
	<hr/>	<hr/>	<hr/>	<hr/>	<hr/>	<hr/>	<hr/>
	59	98	86	79	76	99	79
2.	21	23	32	23	13	24	11
	24	54	11	33	52	23	35
	+54	+12	+36	+42	+13	+20	+23
	<hr/>	<hr/>	<hr/>	<hr/>	<hr/>	<hr/>	<hr/>
	99	89	79	98	78	67	69



Addition Story Problems

The children play store at school. Two children are storekeepers. The other children use play money to buy.

Oral Using the illustration at the top of the page, tell what numbers you would use to solve each problem.

1. How much will Jack have to pay for 4 cakes of soap, a bag of potatoes, and a can of soup? $24+53+11=\square$ 88¢
2. Dick bought a can of soup, 4 cakes of soap, and 3 cans of beans. How much should Dick pay? $11+24+32=\square$ 67¢
3. How much would one dozen oranges and one bag of potatoes cost? $45+53=\square$ 98¢
4. How much money will Jane need if she wants to buy 4 cakes of soap and a can of soup? $24+11=\square$ 35¢
5. Mary bought a dozen oranges and 4 cakes of soap. How much did this cost Mary? $45+24=\square$ 69¢
6. Jane wanted a can of soup, a dozen oranges, and 3 cans of beans. How much should she have to pay? $11+45+32=\square$ 88¢

Written Solve each story problem above. See above.

More About Adding Two-Digit Numbers

Nancy had 48 pages in her scrapbook. She added 16 more pages to the scrapbook. How many pages did she then have in her scrapbook?

You are to think of the pages as being put into one group; so you add the numbers 48 and 16.

Add as shown below. The small 1 in the tens place is a reminder.

$\begin{array}{r} 48 \\ +16 \\ \hline \end{array}$	$\begin{array}{r} \overset{1}{\leftarrow} \\ 4 \text{ tens and } 8 \text{ ones} \\ +1 \text{ ten and } 6 \text{ ones} \\ \hline 6 \text{ tens and } 14 \text{ ones} \end{array}$	$\begin{array}{r} \text{T} \text{O} \\ 1 48 \\ +1 6 \\ \hline 6 4 \end{array}$	$\begin{array}{r} 48 \\ +16 \\ \hline 64 \end{array}$
--	--	--	---

Do you see that 8 ones + 6 ones = 14 ones? Do you see that the form of 14 ones was changed to 1 ten and 4 ones? What was done with the 4 ones? With the 1 ten remembered? Nancy had 64 pages in her book.

Oral For each addition below, be ready to tell the sum and explain the steps you used in adding. See paragraphs above.

	<i>a</i>	<i>b</i>	<i>c</i>	<i>d</i>	<i>e</i>	<i>f</i>	<i>g</i>
1.	$\begin{array}{r} 39 \\ +12 \\ \hline 51 \end{array}$	$\begin{array}{r} 49 \\ +29 \\ \hline 78 \end{array}$	$\begin{array}{r} 33 \\ +28 \\ \hline 61 \end{array}$	$\begin{array}{r} 54 \\ +39 \\ \hline 93 \end{array}$	$\begin{array}{r} 72 \\ +19 \\ \hline 91 \end{array}$	$\begin{array}{r} 24 \\ +67 \\ \hline 91 \end{array}$	$\begin{array}{r} 65 \\ +16 \\ \hline 81 \end{array}$
2.	$\begin{array}{r} 36 \\ +54 \\ \hline 90 \end{array}$	$\begin{array}{r} 47 \\ +48 \\ \hline 95 \end{array}$	$\begin{array}{r} 46 \\ +28 \\ \hline 74 \end{array}$	$\begin{array}{r} 33 \\ +28 \\ \hline 61 \end{array}$	$\begin{array}{r} 35 \\ +45 \\ \hline 80 \end{array}$	$\begin{array}{r} 27 \\ +57 \\ \hline 84 \end{array}$	$\begin{array}{r} 59 \\ +19 \\ \hline 78 \end{array}$
3.	$\begin{array}{r} 34 \\ +37 \\ \hline 71 \end{array}$	$\begin{array}{r} 17 \\ +79 \\ \hline 96 \end{array}$	$\begin{array}{r} 33 \\ +47 \\ \hline 80 \end{array}$	$\begin{array}{r} 46 \\ +16 \\ \hline 62 \end{array}$	$\begin{array}{r} 38 \\ +35 \\ \hline 73 \end{array}$	$\begin{array}{r} 66 \\ +24 \\ \hline 90 \end{array}$	$\begin{array}{r} 37 \\ +15 \\ \hline 52 \end{array}$

Written Copy each addition above. Write each sum. See above.

Addition Story Problems

Susan and Dick made up story problems about their visit to the farm. Do these problems by yourself.

Written Decide how you can use numerals and signs to write each story problem in the language of arithmetic. Then solve each problem.

Dick's problems

1. I counted 39 sheep in one field and 59 sheep in another field. How many sheep did I count? $39+59=\square$
98 sheep
2. I counted 29 turkeys in one field and 45 turkeys in another field. How many turkeys did I count?
 $29+45=\square$ 74 turkeys
3. There were 25 eggs in one basket and 55 eggs in another basket. How many eggs were in both baskets?
 $25+55=\square$ 80 eggs

Susan's problems

4. We filled 11 boxes with yellow apples and 19 boxes with red apples. How many boxes did we fill?
 $11+19=\square$ 30 boxes
5. I counted 29 pumpkins in one pile and 28 in another. How many pumpkins did I count? $29+28=\square$ 57 pumpkins
6. How many ducks are 49 ducks and 27 ducks? $49+27=\square$
76 ducks

Copy. Write each sum.

	<i>a</i>	<i>b</i>	<i>c</i>	<i>d</i>	<i>e</i>	<i>f</i>	<i>g</i>
1.	$\begin{array}{r} 41 \\ +28 \\ \hline 69 \end{array}$	$\begin{array}{r} 33 \\ +28 \\ \hline 61 \end{array}$	$\begin{array}{r} 33 \\ +45 \\ \hline 78 \end{array}$	$\begin{array}{r} 27 \\ +57 \\ \hline 84 \end{array}$	$\begin{array}{r} 59 \\ +19 \\ \hline 78 \end{array}$	$\begin{array}{r} 49 \\ +49 \\ \hline 98 \end{array}$	$\begin{array}{r} 14 \\ +48 \\ \hline 62 \end{array}$
2.	$\begin{array}{r} 33 \\ +47 \\ \hline 80 \end{array}$	$\begin{array}{r} 46 \\ +16 \\ \hline 62 \end{array}$	$\begin{array}{r} 38 \\ +35 \\ \hline 73 \end{array}$	$\begin{array}{r} 66 \\ +24 \\ \hline 90 \end{array}$	$\begin{array}{r} 37 \\ +15 \\ \hline 52 \end{array}$	$\begin{array}{r} 47 \\ +38 \\ \hline 85 \end{array}$	$\begin{array}{r} 48 \\ +12 \\ \hline 60 \\ 97 \end{array}$

$\begin{array}{r} 26 \\ 17 \\ +34 \\ \hline \end{array}$	$\begin{array}{r} 2 \text{ tens} \\ 1 \text{ ten} \\ +3 \text{ tens} \\ \hline 7 \text{ tens} \end{array}$	$\begin{array}{r} 6 \text{ ones} \\ 7 \text{ ones} \\ 4 \text{ ones} \\ \hline 17 \text{ ones} \end{array}$	<table border="1"> <tr> <td>T</td> <td>O</td> </tr> <tr> <td>2</td> <td>6</td> </tr> <tr> <td>1</td> <td>7</td> </tr> <tr> <td>+3</td> <td>4</td> </tr> <tr> <td>7</td> <td>7</td> </tr> </table>	T	O	2	6	1	7	+3	4	7	7
T	O												
2	6												
1	7												
+3	4												
7	7												

Remembering Tens in Column Addition

Mary has 26 stamps from England, 17 stamps from Greece, and 34 stamps from Italy. How many stamps in all does she have from the three countries?

You are to think of the stamps as being put together in one group; so you add the numbers. The arithmetic statement is $26 + 17 + 34 = \square$. The picture at the top of this page shows how to find the sum. Why do you change the form of 17 ones to 1 ten and 7 ones? Why do you add the 1 ten remembered to the tens?

Oral Read. Tell how to find each sum in row 1.
See paragraphs above.

	<i>a</i>	<i>b</i>	<i>c</i>	<i>d</i>	<i>e</i>	<i>f</i>	<i>g</i>
1.	$\begin{array}{r} 37 \\ 14 \\ +26 \\ \hline 77 \end{array}$	$\begin{array}{r} 22 \\ 28 \\ +10 \\ \hline 60 \end{array}$	$\begin{array}{r} 29 \\ 36 \\ +19 \\ \hline 84 \end{array}$	$\begin{array}{r} 46 \\ 13 \\ +12 \\ \hline 71 \end{array}$	$\begin{array}{r} 36 \\ 30 \\ +24 \\ \hline 90 \end{array}$	$\begin{array}{r} 25 \\ 15 \\ +26 \\ \hline 66 \end{array}$	$\begin{array}{r} 37 \\ 18 \\ +29 \\ \hline 84 \end{array}$
2.	$\begin{array}{r} 26 \\ 20 \\ +49 \\ \hline 95 \end{array}$	$\begin{array}{r} 26 \\ 29 \\ +43 \\ \hline 98 \end{array}$	$\begin{array}{r} 19 \\ 22 \\ +36 \\ \hline 77 \end{array}$	$\begin{array}{r} 32 \\ 19 \\ +26 \\ \hline 77 \end{array}$	$\begin{array}{r} 36 \\ 25 \\ +27 \\ \hline 88 \end{array}$	$\begin{array}{r} 24 \\ 36 \\ +37 \\ \hline 97 \end{array}$	$\begin{array}{r} 25 \\ 26 \\ +29 \\ \hline 80 \end{array}$
3.	$\begin{array}{r} 26 \\ 17 \\ +20 \\ \hline 63 \end{array}$	$\begin{array}{r} 30 \\ 15 \\ +39 \\ \hline 84 \end{array}$	$\begin{array}{r} 26 \\ 37 \\ +29 \\ \hline 92 \end{array}$	$\begin{array}{r} 38 \\ 19 \\ +15 \\ \hline 72 \end{array}$	$\begin{array}{r} 18 \\ 29 \\ +27 \\ \hline 74 \end{array}$	$\begin{array}{r} 28 \\ 39 \\ +17 \\ \hline 84 \end{array}$	$\begin{array}{r} 42 \\ 19 \\ +36 \\ \hline 97 \end{array}$

Written Copy 1 through 3 above. Write each sum. Add down. Then check by adding up. See above.

Addition and Subtraction Story Problems

Here are some story problems which the children made up after giving a school show. Read each problem. Use the helps below to help you solve them.

If the question means:	Then you are to:
how many there are altogether	join the sets, or add the numbers of the sets.
how many are left	separate a set into parts, or subtract the numbers of the sets.
how many are gone	
how many more	compare the sets to find by how many they differ, or subtract the numbers of the sets.
how many fewer	
how many more are needed	

Oral Tell whether you would add or subtract to solve each problem. Tell how you decided.

1. A play was written by 12 boys and 8 girls. How many more boys than girls helped write the play?
Subtract; sets are compared $12-8=\square$ 4 boys
2. Songs were to be sung by 19 girls and 17 boys. How many children altogether were chosen to sing?
Add; sets are joined $19+17=\square$ 36 children
3. The play lasted 15 minutes and the songs 15 minutes. How many minutes in all did the show last?
Add; sets are joined $15+15=\square$ 30 minutes
4. Of the 14 boys in the play, 8 were to be Indians. How many were left to be settlers? *Subtract; a set is taken apart $14-8=\square$ 6 settlers*

Written Write problems 1 through 4 in the language of arithmetic. Solve them. *See above.*

Practicing Addition

Knowing the addition facts will help you do column addition. You will also find column addition easier if you can quickly find the sums in such statements as $9+7=16$, and $19+7=26$.

Oral See how quickly you can say each sum in the statements below.

<i>a</i>	<i>b</i>	<i>c</i>	<i>d</i>
1. $9+9=\square$ ¹⁸	$19+9=\square$ ²⁸	$7+6=\square$ ¹³	$27+6=\square$ ³³
2. $6+8=\square$ ¹⁴	$16+8=\square$ ²⁴	$8+7=\square$ ¹⁵	$28+7=\square$ ³⁵
3. $8+5=\square$ ¹³	$18+5=\square$ ²³	$9+6=\square$ ¹⁵	$29+6=\square$ ³⁵
4. $5+7=\square$ ¹²	$25+7=\square$ ³²	$3+8=\square$ ¹¹	$23+8=\square$ ³¹
5. $8+4=\square$ ¹²	$18+4=\square$ ²²	$4+9=\square$ ¹³	$24+9=\square$ ³³
6. $8+9=\square$ ¹⁷	$28+9=\square$ ³⁷	$7+4=\square$ ¹¹	$27+4=\square$ ³¹
7. $9+3=\square$ ¹²	$29+3=\square$ ³²	$5+9=\square$ ¹⁴	$25+9=\square$ ³⁴
8. $3+7=\square$ ¹⁰	$13+7=\square$ ²⁰	$7+7=\square$ ¹⁴	$17+7=\square$ ²⁴
9. $7+9=\square$ ¹⁶	$27+9=\square$ ³⁶	$8+7=\square$ ¹⁵	$18+7=\square$ ²⁵

Written Copy. Write each sum. Check.

	<i>a</i>	<i>b</i>	<i>c</i>	<i>d</i>	<i>e</i>	<i>f</i>	<i>g</i>
1.	19 20 +36 <hr/> 75	18 38 +27 <hr/> 83	37 36 +10 <hr/> 83	18 29 +47 <hr/> 94	10 12 +19 <hr/> 41	14 21 +19 <hr/> 54	25 25 +20 <hr/> 70
2.	19 46 +24 <hr/> 89	36 19 +17 <hr/> 72	18 17 +55 <hr/> 90	20 19 +41 <hr/> 80	10 58 +15 <hr/> 83	38 26 +29 <hr/> 93	28 25 +30 <hr/> 83

Read each story problem. Then write the problem in the language of arithmetic and solve it. *Reminder:* If you are to put groups, or sets, together, you add.

1. Ann counted 32 pupils in first grade, 27 pupils in second grade, and 35 pupils in third grade. How many pupils did Ann count in all 3 grades?
 $32+27+35=\square$ 94 pupils
2. Jane counted 19 sheets of paper in one package, 25 sheets in another package, and 35 sheets in another package. How many sheets of paper did Jane count?
 $19+25+35=\square$ 79 sheets of paper
3. The grocer had 25 cans of green beans, 42 cans of wax beans, and 17 cans of lima beans. How many cans of beans did he have altogether? $25+42+17=\square$
84 cans
4. In the circus parade there were 15 clowns, 26 marchers in the band, 42 horseback riders, and 16 acrobats. How many people were in the parade?
 $15+26+42+16=\square$ 99 people
5. The Mothers' Club made sandwiches for the class picnic. They made 36 jelly sandwiches, 21 peanut butter sandwiches, 17 cheese sandwiches, and 18 meat sandwiches. How many sandwiches did they make altogether? $36+21+17+18=\square$ 92 sandwiches
6. At the picnic the children drank 24 bottles of root beer, 17 bottles of orange soda, and 28 bottles of ginger ale. How many bottles of soft drinks did the children drink? $24+17+28=\square$ 69 bottles

Can you do this? Replace each \blacksquare with the correct numeral.

$$\begin{array}{r} a \\ \blacksquare 5 \\ 2 \blacksquare \\ +12 \\ \hline 68 \end{array}$$

$$\begin{array}{r} b \\ 23 \\ \blacksquare 5 \\ +21 \\ \hline 59 \end{array}$$

$$\begin{array}{r} c \\ \blacksquare \blacksquare \\ 26 \\ +11 \\ \hline 69 \end{array}$$

$$\begin{array}{r} d \\ 12 \\ \blacksquare \blacksquare \\ +53 \\ \hline 99 \end{array}$$

Should You Add or Subtract?

To solve problems 1 through 6, follow these steps:

Read each problem.

Find out the story that is told.

Pay special attention to the question.

Decide what you should do with the groups, or sets, to answer the question. *Reminder:* If the sets are to be put together, add the numbers. If the sets are to be taken apart, or if you are to find by how many one set differs from another, subtract the numbers.

Oral Tell whether you would add or subtract to solve each of these problems. Tell how you decided.

1. At the third grade's pet show there were 15 dogs and 7 cats. How many fewer cats were there than dogs?
Subtract; sets are compared $15-7=\square$ 8 cats
2. John picked 27 quarts of berries. Tom picked 32. How many quarts of berries did the two boys pick?
Add; sets are joined $27+32=\square$ 59 quarts
3. Pat's brother is 13 years old. Her sister is 8 years younger. How old is Pat's sister? *Subtract; sets are compared $13-8=\square$ 5 years old*
4. Ann spent 65¢ for doll chairs. Then she had 23¢ left. How much money did she have at first? *Add; sets are joined $65+23=\square$ 88¢*
5. Betty had 14 problems to solve. When she had finished 9, how many more did she have to do?
Subtract; sets are compared $14-9=\square$ 5 problems
6. Dan had 31¢. Then he earned 35¢. How much money did he have then? *Add; sets are joined $31+35=\square$ 66¢*

Written Write problems 1 through 6 above in the language of arithmetic and solve them. *See above.*

Checkup Time

The numerals in () tell the pages where you can turn for help if you need it.

Important Ideas

- When you add two two-digit numbers, you can add tens just as you add ones. (93)
- When adding two-digit numbers and the sum of the ones is 10 or more, change the form of the ones to tens and ones. Add the tens in the tens place. (96)

Questions to Discuss

See T103 for answers.

- What steps do you use in the addition at the right? (93)
- How is adding two two-digit numbers like adding two one-digit numbers? (93)
- Why must you change a sum of sixteen ones to 1 ten and ones in an addition? (96)
- How would you add in *a*, *b*, and *c* below?

<i>a</i>	<i>b</i>	<i>c</i>
$\begin{array}{r} 16 \\ 30 \\ +22 \\ \hline \end{array}$	$\begin{array}{r} 17 \\ +23 \\ \hline \end{array}$	$\begin{array}{r} 16 \\ 45 \\ +23 \\ \hline \end{array}$
(94)	(96)	(98)

Written Practice

Copy. Write each sum.

	<i>a</i>	<i>b</i>	<i>c</i>
1.	$\begin{array}{r} 26 \\ +12 \\ \hline 38 \end{array}$	$\begin{array}{r} 34 \\ +15 \\ \hline 49 \end{array}$	$\begin{array}{r} 87 \\ +12 \\ \hline 99 \end{array}$
2.	$\begin{array}{r} 21 \\ 32 \\ +15 \\ \hline 68 \end{array}$	$\begin{array}{r} 10 \\ 17 \\ +32 \\ \hline 59 \end{array}$	$\begin{array}{r} 12 \\ 42 \\ +14 \\ \hline 68 \end{array}$
3.	$\begin{array}{r} 47 \\ +26 \\ \hline 73 \end{array}$	$\begin{array}{r} 53 \\ +18 \\ \hline 71 \end{array}$	$\begin{array}{r} 29 \\ +46 \\ \hline 75 \end{array}$
4.	$\begin{array}{r} 27 \\ 36 \\ +18 \\ \hline 81 \end{array}$	$\begin{array}{r} 22 \\ 10 \\ +38 \\ \hline 70 \end{array}$	$\begin{array}{r} 27 \\ 38 \\ +17 \\ \hline 82 \end{array}$
	(93)	(94)	(96)
	(98)	(99)	(98)

Write each of these problems in the language of arithmetic. Then explain how you find the missing number. (95, 99)

- One school bus holds 47 children. The other bus holds 26 children. How many children can ride the buses at the same time? Add $47+26=\square$ 73 children
- Mary bought eggs for 42¢, milk for 26¢, and bread for 15¢. How much did she spend in all? Add $42+26+15=\square$ 83¢

Self-Evaluation

Part 1 Copy. Write each sum or difference.

	<i>a</i>	<i>b</i>	<i>c</i>	<i>d</i>
1.	$\begin{array}{r} 9 \\ -7 \\ \hline 2 \end{array}$	$\begin{array}{r} 9 \\ +8 \\ \hline 17 \end{array}$	$\begin{array}{r} 9 \\ +4 \\ \hline 13 \end{array}$	$\begin{array}{r} 4 \\ -4 \\ \hline 0 \end{array}$
2.	$\begin{array}{r} 14 \\ +3 \\ \hline 17 \end{array}$	$\begin{array}{r} 13 \\ +5 \\ \hline 18 \end{array}$	$\begin{array}{r} 25 \\ +2 \\ \hline 27 \end{array}$	$\begin{array}{r} 35 \\ +4 \\ \hline 39 \end{array}$
3.	$\begin{array}{r} 38 \\ +6 \\ \hline 44 \end{array}$	$\begin{array}{r} 33 \\ +9 \\ \hline 42 \end{array}$	$\begin{array}{r} 34 \\ +7 \\ \hline 41 \end{array}$	$\begin{array}{r} 59 \\ +7 \\ \hline 66 \end{array}$
4.	$\begin{array}{r} 35 \\ 4 \\ +1 \\ \hline 40 \end{array}$	$\begin{array}{r} 8 \\ 44 \\ +5 \\ \hline 57 \end{array}$	$\begin{array}{r} 87 \\ 5 \\ +6 \\ \hline 98 \end{array}$	$\begin{array}{r} 5 \\ 7 \\ +56 \\ \hline 68 \end{array}$
5.	$\begin{array}{r} 43 \\ 14 \\ +21 \\ \hline 78 \end{array}$	$\begin{array}{r} 12 \\ 14 \\ +73 \\ \hline 99 \end{array}$	$\begin{array}{r} 25 \\ 32 \\ +32 \\ \hline 89 \end{array}$	$\begin{array}{r} 32 \\ 30 \\ +15 \\ \hline 77 \end{array}$

Part 2 Read, think, and do.

1. Write the name of each number in the addition statement at the right. For example, the 6 is an *addend*.

$$\begin{array}{r} \text{addend} \quad 6 \\ \text{addend} \quad +2 \\ \hline \text{sum} \quad 8 \end{array}$$

2. Write the name of each number in the subtraction statement at the right.

Minuend, 7; subtrahend, 3;
104 difference, 4

$$\begin{array}{r} 7 \\ -3 \\ \hline 4 \end{array}$$

Part 3 Solve problems 1 through 6 below.

1. At the third grade's pet show there were 12 dogs and 7 birds. How many fewer birds were there than dogs? $12-7=\square$

5 fewer birds

2. Of the 17 children in our swimming class, 9 can already swim. How many of the children in the class cannot yet swim?

$17-9=\square$ 8 children

3. Our milkman left 16 quarts of milk last week and 21 quarts this week. How many quarts did he leave in two weeks? $16+21=\square$

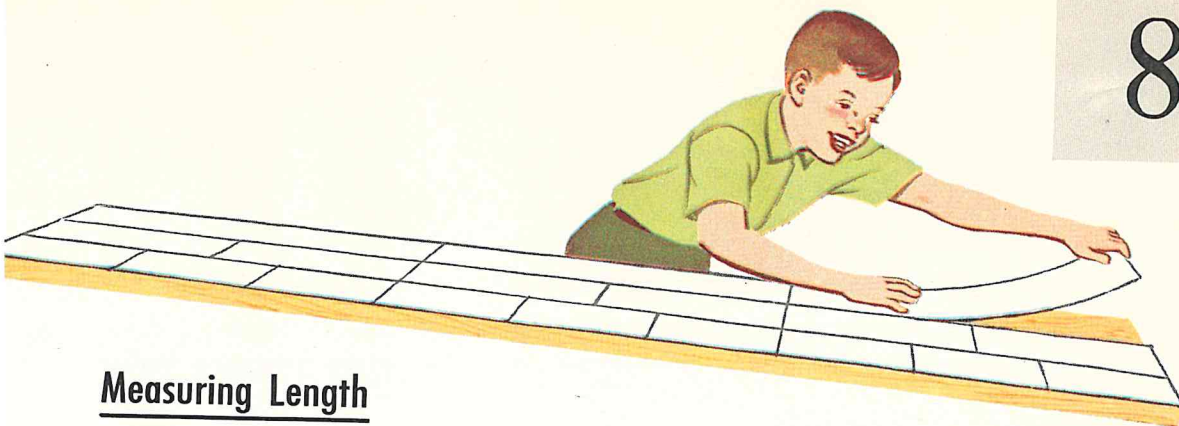
37 quarts

4. Judy put 36 books in a large box. Dorothy put in 5 more books. How many books were then in the box? $36+5=\square$ 41 books

5. Jack put 15 books on the top shelf, 20 books on the middle shelf, and 27 on the bottom shelf. How many books did he put on all the shelves? $15+20+27=\square$

62 books

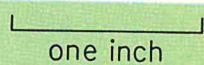
6. Sidney's mother bought a loaf of bread for 21¢ and a pie for 49¢. How much did she pay for both? $21+49=\square$ 70¢



Measuring Length

John has used pieces of cardboard to measure the board. He has shown that 9 of the small pieces of cardboard, 6 of the middle-sized pieces, and 3 of the longest pieces are needed to measure the length. John could not tell the length of the board without showing you the length of the pieces of cardboard he used in measuring it.

John might have measured the board using a **standard unit of measure** of length, such as the **inch**. In this country *standard units of measure* are set by law.



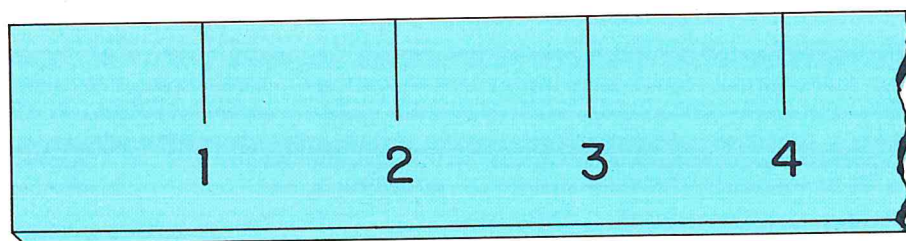
John could have used a measure 1 inch long when he measured the board. Do you see that he could have told the length of the board in inches?

Something to do Cut 6 pieces of paper each 1 inch long. Fit them end to end on the straws below. Count them and tell the length of the straws in inches.

1.  2 inches

2.  1 inch

3.  3 inches


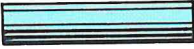



Learning About a Ruler

Look at the part of a ruler in the picture above. Notice that it looks very much like a number line. Each of the numerals shows the number of inches from the left end of the ruler to the line above the numeral. The distance from 1 to 2 is the same length as the distance from 2 to 3 or 3 to 4. From the beginning point to 1 is 1 inch. From the beginning point to 2 is 2 inches. What is the distance in inches from the beginning point to 3? To 4? What is the distance between 1 and 2? Between 2 and 3?

To use a ruler in measuring an object shorter than the ruler itself, place the beginning point of the ruler just opposite one end of the object you want to measure. Then find the numeral on your ruler that is just opposite the other end of the object. This numeral tells the length of the object in inches.

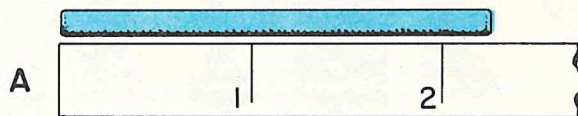
Written Trace the part of a ruler in the picture above or use another ruler that shows inches. Measure each rod. Write the numeral that tells its length in inches.

1.  3 inches
2.  1 inch
3.  4 inches

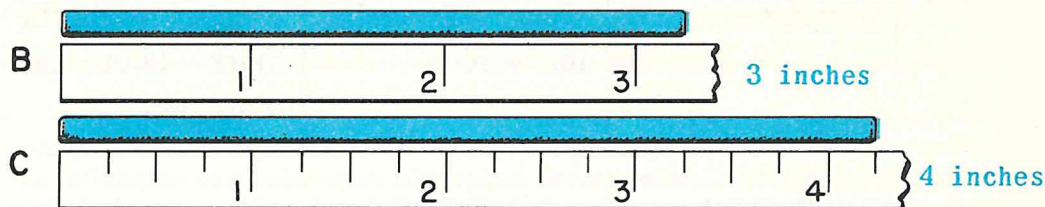
Using a Foot Ruler

Jim has three different rulers. Each one is marked off in inches. The distance between the beginning point and the end point of each ruler is 12 inches. Each ruler is called a *foot ruler* because 12 inches are equal in length to 1 foot. Each ruler is marked differently, but all rulers can be used the same way.

Jim used ruler A to measure the stick of candy. The stick is a little nearer to 2 inches long than to 3 inches long. So Jim said, "The candy is *about* 2 inches long." He gave the length to the nearest inch.



Oral Look at these pictures. Notice how rulers B and C are placed to measure the candy sticks. Be ready to point out the beginning point of each ruler. Then tell how long each piece of candy is to the nearest inch.



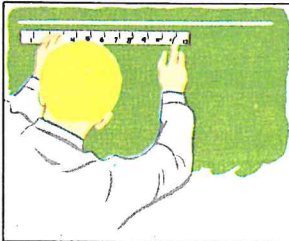
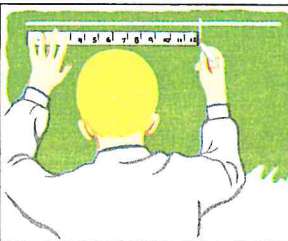
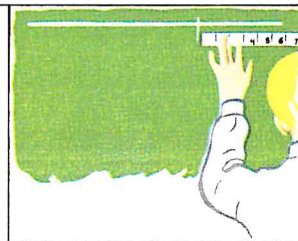
Written Use a foot ruler to measure each of these rods. Write the length to the nearest inch.

1. 3 inches
2. 1 inch
3. 4 inches

Using Your Ruler

If you measure a pencil from one end to the other, you will find its **length**. If you measure a doll from top to bottom, you will find how high it is, or its **height**. You can use your ruler to discover the length of objects which are longer than the ruler itself.

Look at the pictures below. Peter is using a foot ruler to measure a drawing on the chalkboard.

		
A Peter measures the first 12 inches of the drawing.	B Peter makes a mark at the end of the ruler to show 12 inches measured.	C Peter measures the rest of the drawing beginning with the mark. There are 6 inches.

In the pictures above, Peter is showing that the drawing is 12 inches plus 6 inches long. $12 + 6 = 18$. The drawing is 18 inches long.

Written Read, think, and do.

1. Measure the length and width of your desk.
2. Find and write the height or length of several objects in your classroom.

Inches, Feet, and Yards

Peter wanted to measure the height of his desk. His foot ruler was not long enough to use easily. The teacher suggested he use a yardstick instead. Why?

Peter saw that the distance between the beginning and end points of the yardstick was 36 inches. Then he measured the yardstick with his foot ruler. He found that 3 feet are equal in length to one yard.

He made a chart that shows what he had learned about inches, feet, and yards. When used with measures, the = sign means *measures the same as*. Then 3 ft. = 1 yd. means that 3 feet measures the same distance as 1 yard.

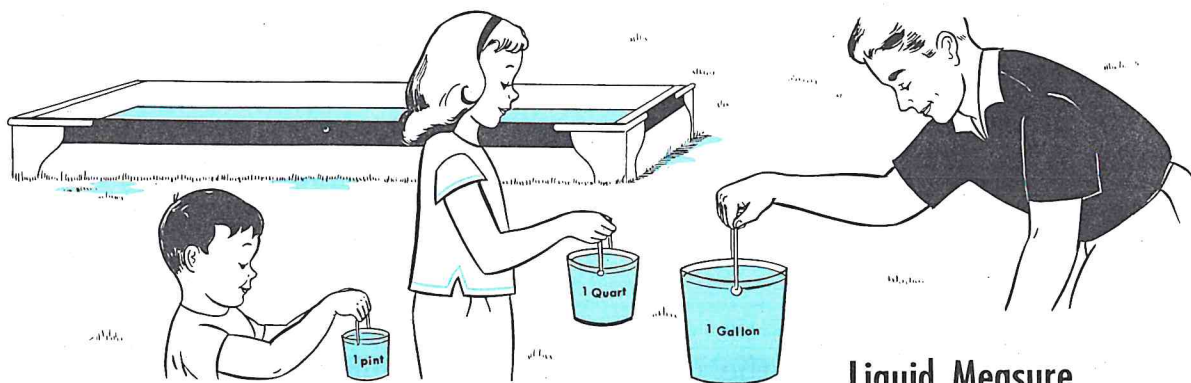
1 foot = 12 inches
3 feet = 36 inches
1 yard = 3 feet
inches (in.)
feet (ft.)
yards (yd.)

Oral Answer these questions.

1. Would you use a foot ruler or a yardstick to measure the length of your classroom? Why? **Yardstick; saves time**
2. If you wanted to measure the length of a playground, would it be more convenient to give the length in inches, feet, or yards? Why? **Yards; answers will vary.**

Written Copy. Write each answer.

- | <i>a</i> | <i>b</i> |
|------------------------------------|---------------------------------|
| 1. 12 in. + 8 in. = <u>20</u> in. | 24 in. + 9 in. = <u>33</u> in. |
| 2. 24 in. + 8 in. = <u>32</u> in. | 36 in. + 10 in. = <u>46</u> in. |
| 3. 38 in. - 19 in. = <u>19</u> in. | 45 in. - 12 in. = <u>33</u> in. |

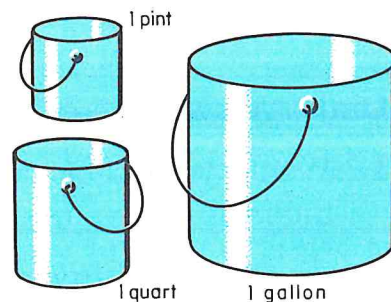


Liquid Measure

“We each have 1 pail of water,” said Agnes, “but we do not each have the same amount of water.”

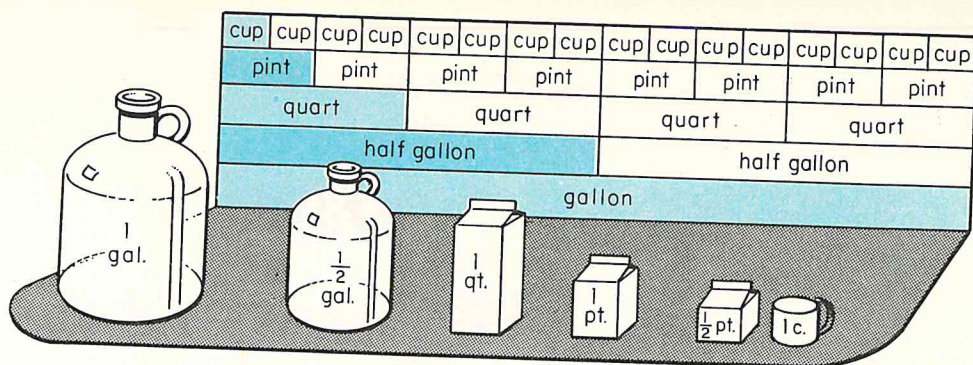
Each of the pails in the picture above is different in size. The little boy would have to fill his pint pail two times to carry as much water as Agnes can carry in 1 quart pail of water. Agnes would have to fill her pail four times to carry as much water as her father can carry in 1 gallon pail of water.

The boy’s pail holds 1 **pint**.
 Agnes’s pail holds 1 **quart**.
 Father’s pail holds 1 **gallon**.
 The *pint*, the *quart*, and the *gallon* are units of measure for liquids.



Oral Be ready to answer these questions.

1. How would you use a quart measure to find the amount of water in a pail full of water? *Count the number of times the quart measure is used to empty the pail.*
2. What are some units of measure used for water? Milk? *Cup, pint, quart, half gallon, gallon*
3. How could you measure the water in a large can using a gallon measure? A quart measure? *Count the number of times the gallon measure is used to empty the can; count the number of times the quart measure is used to empty the can.*



Comparing Liquid Measures

In one school the children made the display and chart shown above. The picture shows units of measure used to measure *liquids*. A liquid is anything that pours, like milk, water, or syrup.

Then the children made the chart at the right to show how the different units of measure compare in size.

1 cup = $\frac{1}{2}$ pint
 2 cups = 1 pint
 2 pints = 1 quart
 4 quarts = 1 gallon

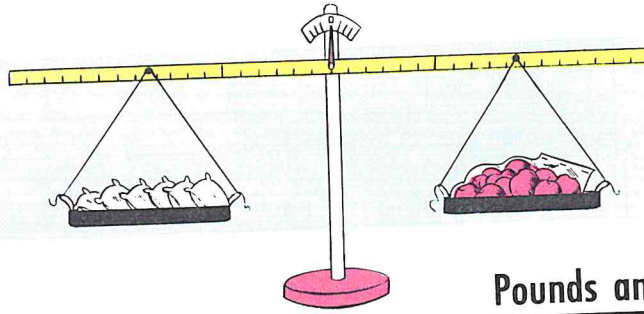
Oral Which numeral should replace the — in each of these sentences? Use the chart to help you find the answers. Remember, = means *measures the same as*.

- ^{two} 2 cups = 1 pint.
- ^{two} 2 pints = 1 quart.
- ^{four} 4 quarts = 1 gallon.
- ^{eight} 8 pints = 1 gallon.
- ^{sixteen} 16 cups = 1 gallon.
- ^{four} 4 cups = 1 quart.
- ^{four} 4 pints = 1 half gallon.
- ^{two} 4 pints = 2 quarts.
- ^{two} 8 cups = 2 quarts.
- ^{four} 8 cups = 4 pints.

Written Copy the statements above. Replace each — with the correct numeral. See above.

MORE PRACTICE

PAGE 307



Pounds and Ounces

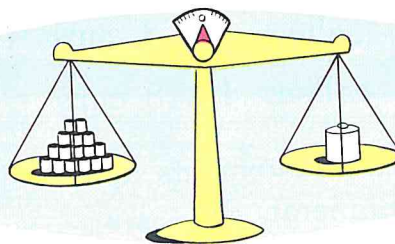
The children have made balance scales. The pans are **balanced** or are level when there is the same weight in each. How many of the bags of salt are needed to make the left pan balance with the pan containing the bag of apples?

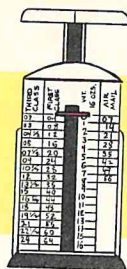
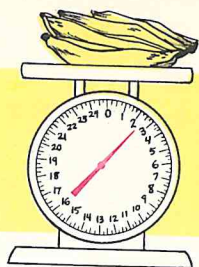
Could you tell how much the apples weigh without showing someone the bags of salt you used to balance the apples?

If you use a standard unit of measure, such as the **pound**, you would be able to describe the weight of the apples so most people would understand.

Pretend that the bags of salt weigh exactly 1 pound each. Do you see that the weight of the apples on the scale is exactly 6 pounds?

Some things such as letters are measured in units smaller than a pound. The common unit of measure used to measure them is the **ounce**. One pound measures the same weight as sixteen ounces.





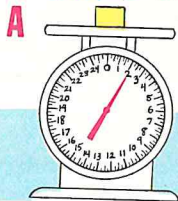
The hand on the kitchen scale above has moved from 0 to almost 3 on the dial. The bananas weigh more than 2 pounds and less than 3 pounds. The hand is closer to 3 than to 2. Therefore, the weight of the bananas to the *nearest pound* is 3 pounds.

The shorter lines halfway between the numbered lines on the kitchen scale are used to measure weights to the nearest *half pound*. The hand is closer to the line marking the half pound than to the 3. Therefore, the weight of the bananas to the *nearest half pound* is 2 and $\frac{1}{2}$ pounds.

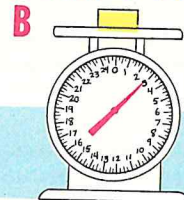
Oral Answer these questions.

1. Why must the pointer of a weighing scale be set at 0 before you try to weigh anything on it? **Because we count from zero.**
2. Tell the weight shown on each scale below to the nearest pound. To the nearest half pound.

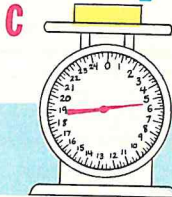
2 lb.; 2 lb.



3 lb.; 3 lb.



6 lb.; 5½ lb.



Written Write the names of 5 things that are sold by the pound. List as many things as you can think of that are sold by the ounce. (Newspapers will help you to find some examples.) **Answers will vary.**

MORE PRACTICE
PAGE 307

JANUARY

S	M	T	W	T	F	S
						1
2	3	4	5	6	7	8
9	10	11	12	13	14	15
16	17	18	19	20	21	22
23	24	25	26	27	28	29
30	31					

FEBRUARY

S	M	T	W	T	F	S
		1	2	3	4	5
6	7	8	9	10	11	12
13	14	15	16	17	18	19
20	21	22	23	24	25	26
27	28					

MARCH

S	M	T	W	T	F	S
		1	2	3	4	5
6	7	8	9	10	11	12
13	14	15	16	17	18	19
20	21	22	23	24	25	26
27	28	29	30	31		

APRIL

S	M	T	W	T	F	S
						1
2	3	4	5	6	7	8
9	10	11	12	13	14	15
16	17	18	19	20	21	22
23	24	25	26	27	28	29
30						

MAY

S	M	T	W	T	F	S
1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28
29	30	31				

JUNE

S	M	T	W	T	F	S
			1	2	3	4
5	6	7	8	9	10	11
12	13	14	15	16	17	18
19	20	21	22	23	24	25
26	27	28	29	30		

JULY

S	M	T	W	T	F	S
						1
2	3	4	5	6	7	8
9	10	11	12	13	14	15
16	17	18	19	20	21	22
23	24	25	26	27	28	29
30	31					

AUGUST

S	M	T	W	T	F	S
	1	2	3	4	5	6
7	8	9	10	11	12	13
14	15	16	17	18	19	20
21	22	23	24	25	26	27
28	29	30	31			

SEPTEMBER

S	M	T	W	T	F	S
				1	2	3
4	5	6	7	8	9	10
11	12	13	14	15	16	17
18	19	20	21	22	23	24
25	26	27	28	29	30	

OCTOBER

S	M	T	W	T	F	S
						1
2	3	4	5	6	7	8
9	10	11	12	13	14	15
16	17	18	19	20	21	22
23	24	25	26	27	28	29
30	31					

NOVEMBER

S	M	T	W	T	F	S
		1	2	3	4	5
6	7	8	9	10	11	12
13	14	15	16	17	18	19
20	21	22	23	24	25	26
27	28	29	30			

DECEMBER

S	M	T	W	T	F	S
				1	2	3
4	5	6	7	8	9	10
11	12	13	14	15	16	17
18	19	20	21	22	23	24
25	26	27	28	29	30	31

The Calendar

Bob's birthday was on January 1, the first day of a new year. His birthday was on a Saturday. He could look at a calendar for next year to find the day when his birthday comes that year.

A calendar shows the divisions of time in a year (days, weeks, and months). The beginning of each month is labeled 1. Which numeral shows the end of January? Of February? Of March?

You can use a calendar to measure time in days by crossing out a numeral on the calendar for each day as it passes. How many numerals would you cross out by the end of January? By the end of February? By the end of the year? If you were to cross out a numeral for each day in a year, you would cross out 365 numerals.

You can measure time in weeks by finding the beginning point of the first full week in the year. Then you cross out each group of 7 days. What is the ending point for the last full week in January? How many days are in each full week?

You can use a calendar to measure time in months by tearing pages from a calendar as each month passes and keeping the pages you have torn off. When you want to know how many months have passed, you can count the pages you have kept.

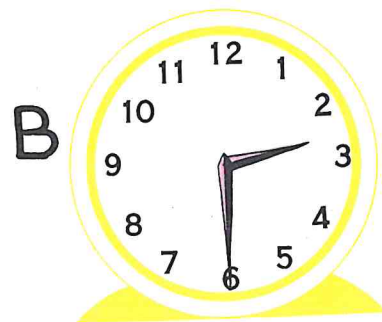
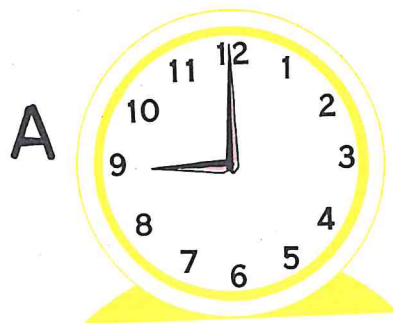
How many pages will you have torn off by the end of February? By the end of June? By the end of December?

Oral Answer these questions, using the calendar on page 114.

1. How many days are there in January? In February?
31; 28
2. Which months have 30 days? 31 days? April, June, Sept., Nov.; Jan., March, May, July, Aug., Oct., Dec.
3. What is the first day of the week? The last day?
Sunday; Saturday
4. What date is the first Monday in February? The second Tuesday in February? 7; 8
5. By looking at the calendar for June, can you tell what day of the week will be July 1? How? Yes; The day of the week that follows the day on which June 30 falls.

A quick review

a	b	c	d
1. $7 + 8 = \square$	$15 - 8 = \square$	$8 + 7 = \square$	$15 - 7 = \square$
2. $9 + 6 = \square$	$15 - 6 = \square$	$6 + 9 = \square$	$15 - 9 = \square$
3. $8 + 9 = \square$	$17 - 9 = \square$	$9 + 8 = \square$	$17 - 8 = \square$



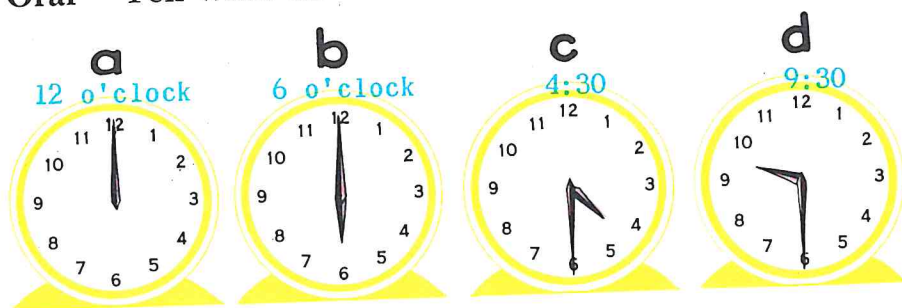
Telling Time

The short hand on a clock is called the **hour hand**. It measures time in hours. The beginning point for measuring hours is 12. The hour hand on clock A began at 12. It now points to 9. It takes 1 hour to pass from one numeral to the next. Has the hour hand measured 9 hours?

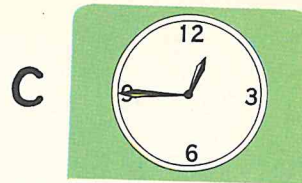
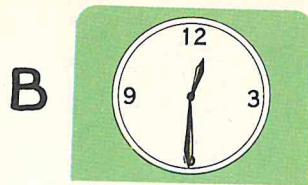
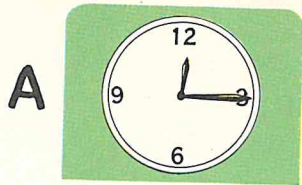
The long hand is called the **minute hand**. As it moves from 12 to 1, it measures 5 minutes. When it reaches 2, it measures 10 minutes. In one complete turn, the minute hand measures 60 minutes, or 1 hour.

Find the hour hand on clock B. Where does it point? Find the minute hand. The time is *half past 2*.

Oral Tell what time each of these clocks shows.



Written Draw three clock faces. Show these times: half past 7, 8 o'clock, and half past 11.



More About Clocks

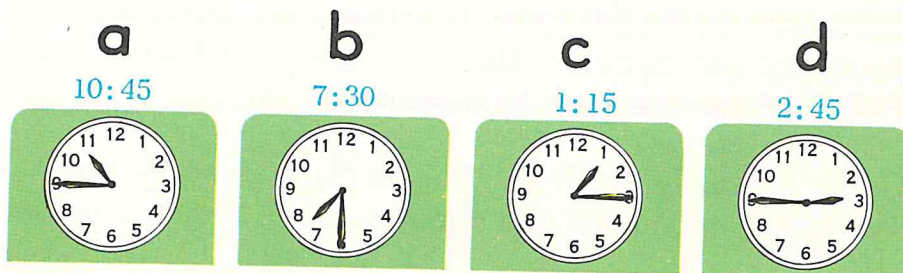
The clocks in the picture above have only the numerals 12, 3, 6, and 9 on their faces. These numerals mark the four quarters of an hour shown by the minute hand.

When the minute hand moves from 12 to 3 as in A, it shows that *one quarter* of an hour has passed. When the minute hand moves from 12 to 6 as in B, two quarters, or half an hour, have passed. When the minute hand moves from 12 to 9 as in C, three quarters of an hour have passed. The time is 1 quarter of an hour before 1.

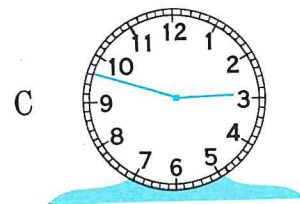
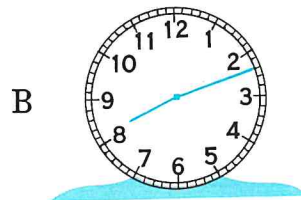
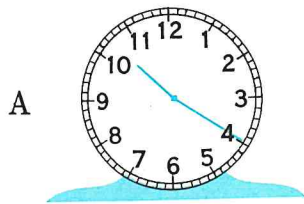
Clock A is read: "A quarter past 12." Clock B is read: "Half past 12." Clock C is read: "A quarter to 1."

Oral Read, think, and do.

- From which numeral to which other numeral does the minute hand move to tell a quarter past the hour? Half past the hour? A quarter to the next hour?
12-3; 12-6; 12-9
- Tell the time on each of these clocks.



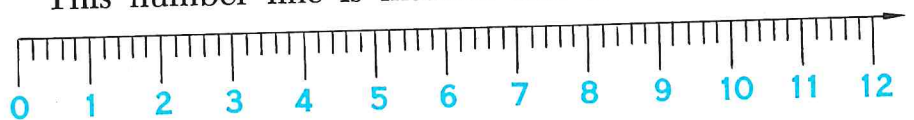
Written Write the answers to question 2 above.
See above.



Telling Time in Minutes

Look at the lines and spaces between 12 and 1 on the clock faces above. As the minute hand moves from 1 line to the next, it measures 1 minute. There are 60 minutes in an hour. Each numeral marks 5 minutes.

This number line is marked like the dial on a clock.



Try reading the number line. Move your finger from the beginning point to 1. Say, "5 minutes." Move to 2. Say, "10 minutes." Move to 3. Say, "15 minutes." Move to 4. Say, "20 minutes."

Now try reading clock A. Point to its beginning point, 12. Then move your finger to 1. Say, "5 minutes." Move to 2. Say, "10 minutes." What would you say as you move to 3? To 4? Clock A shows 20 minutes past 10 o'clock.

You can write the time by writing the hour, 10, followed by the minutes, 20, in this way: 10:20. 10:20 means 20 minutes past 10 o'clock.

Oral Be ready to tell the time on clocks B and C above. Tell how you counted the minutes. 8:12; 2:48; See number line above.

Something to do Draw clocks showing each of these times: 7:30, 8:45, 6:25, 2:38, 5:49.



A Dozen

Susan went shopping for her mother. She bought eggs, rolls, and milk. The signs on the eggs and rolls showed they were measured *by the dozen*.

Susan said, "There are 12 eggs in the egg box. A dozen eggs are 12 eggs." Then Susan counted the rolls in the package. She said, "One dozen rolls are 12 rolls. One dozen means 12 of something, or a set of 12."

Look at the picture above. The ginger ale is sold by the half-dozen bottles. How many bottles make a half dozen?

Oral Be ready to answer these questions:

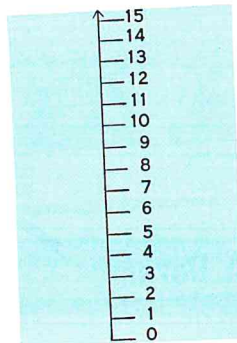
1. How many pencils would be packed in a box marked *one half dozen*? **6**
2. If there were to be a dozen people at dinner, how many dinner plates would you use? **12**

Written Make a list of all the things you can think of that you can buy by the dozen. **Answer will vary.**

Can you do this? Write the numerals you would say when you skip count to 96 by 12's. **12, 24, 36, 48, 60, 72, 84, 96**

Measuring Temperature

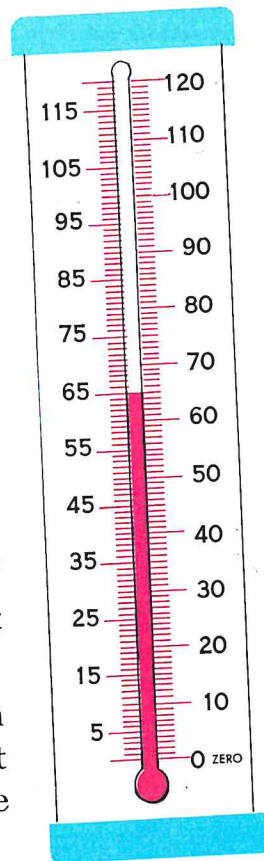
Look at the number line at the right. Put your finger on 0 on the number line. Move your finger towards the top of the number line. Stop at 10. You have moved 10 spaces. This time begin at 15. Move your finger toward the bottom of the number line. Stop at 2. You have moved 13 spaces.



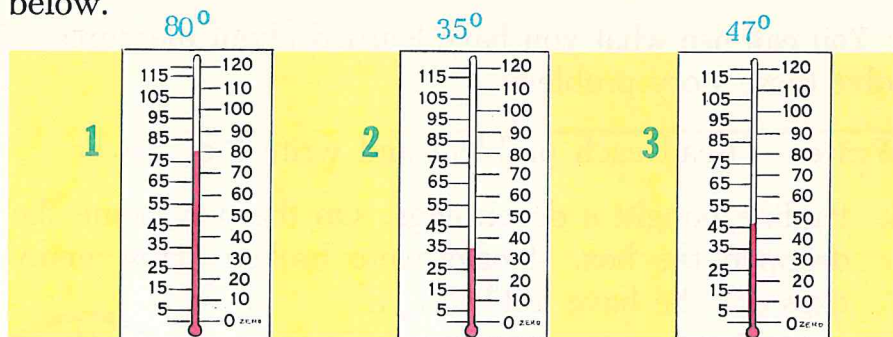
Now look at the **thermometer** at the right. A thermometer is used to measure **temperature**. The colored liquid moves up as the liquid becomes heated. It moves down as the liquid is cooled.

Each small line on the thermometer shows a unit of measure called a **degree** of temperature. The sign for a *degree* is written $^{\circ}$. It is the unit of measure we use for temperature. The lines on a thermometer are numbered just as a number line is numbered. The beginning point on this thermometer is 0. As the liquid moves from one numbered line to the next, it measures 5 degrees of temperature. The top of the column of liquid is at the line numbered 65. It shows that the temperature is 65° .

As the column of liquid moves from any one of the shorter lines to the next, it measures 1 degree. Why isn't each of the shorter lines numbered?



Oral Read the temperature on each thermometer below.



Written You read the scale of a thermometer just as you read the numbers on a number line. Use the scale to find and write the answers to these questions.

1. If the temperature is 63° at 7 o'clock and is 85° at 10 o'clock, how many degrees has it risen? 22°
2. If the temperature is 59° at 6 o'clock and falls 8° in five hours, what will the temperature be then? 51°
3. If the temperature was 68° at noon and dropped to 42° by 6 o'clock, how many degrees colder was it at 6 o'clock than at noon? 26°

Look at this chart of temperature readings taken one day. Write the answers to the questions.

4. At what time was the temperature highest? Lowest? $12:00$; $9:00$

5. Did the temperature go up or down during the day? Up

6. What was the difference between the temperature at 9 o'clock and at 10 o'clock? 8°

9:00	9°
10:00	17°
11:00	28°
12:00	42°

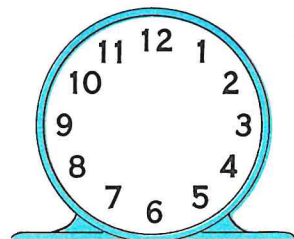
Problems Using Measures

You can use what you have learned about measures to solve these story problems.

Written Read each problem and write the answer.

1. Pauline bought a dozen eggs. On the way home she dropped the box. 4 eggs were broken. How many eggs did she have left? **8 eggs**

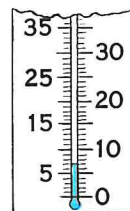
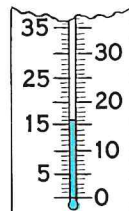
2. Peter left his house at 3:20. He walked directly to John's house. It took him 15 minutes. At what time did he arrive at John's house? **3:35**



3. Alice went to the movies. She arrived at 7:35. The doorman told her that the picture had started 20 minutes before. At what time did the picture begin?

7:15

4. One cold winter's day the thermometer on the porch read 16° at noon and 7° at 5 o'clock. How many degrees did the temperature drop between noon and 5 o'clock? **90**



5. Jerry had a quart of milk. How many cups of milk could he pour from the 1 quart? **4 cups**
6. Marvin had 1 pint of milk. He wanted 1 quart. How much more milk did he need to make 1 quart? **1 pint**
7. The table in the reading corner measured 1 yard and 1 foot long. How long is that in feet? In inches? **4 feet; 48 inches**

12 inches = 1 foot
36 inches = 1 yard
3 feet = 1 yard

Checkup Time

The numerals in () tell the pages where you can turn for help if you need it.

Important Ideas

1. You can decide upon the unit of measure to use after you know the kind of object or quantity you are measuring. (105, 110, 112, 114, 116, 120)

2. Units of measure which are set by law are called standard units of measure. (105)

3. You can tell the measure of anything by using numbers to tell how many units of measure you used in measuring it. (106)

Words to Know

1. Length: inch, foot, and yard. (109)

2. Liquid: cup, pint, quart, and gallon. (111)

3. Weight: ounce, pound. (112)

4. Time: minute, hour, day, week, month, and year. (114, 116)

5. Temperature: degree. (120)

Questions to Answer

See T123 for answers.

1. Why do you measure in standard units of measure? (105)

2. What units of measure are used to measure length? (109)

3. What units of measure are used to measure liquids? (110)

4. What units of measure are used to measure weight? (112)

5. What units of measure do you use in measuring time? (116)

6. What units of measure do you use in measuring temperature? (120)

Written Practice

Copy. Write the correct numeral in each blank space.

1. 3 feet = 1 yard (109)

2. 2 pints = 1 quart (111)

3. 16 ounces = 1 pound (112)

4. 60 minutes = 1 hour (116)

Self-Evaluation

Part 1 Copy. Write each sum or difference. Watch the signs.

	<i>a</i>	<i>b</i>	<i>c</i>	<i>d</i>
1.	$\begin{array}{r} 2 \\ 5 \\ +0 \\ \hline 7 \end{array}$	$\begin{array}{r} 1 \\ 8 \\ +0 \\ \hline 9 \end{array}$	$\begin{array}{r} 3 \\ 2 \\ +2 \\ \hline 7 \end{array}$	$\begin{array}{r} 2 \\ 5 \\ +1 \\ \hline 8 \end{array}$
2.	$\begin{array}{r} 24 \\ 53 \\ +11 \\ \hline 88 \end{array}$	$\begin{array}{r} 20 \\ 20 \\ +49 \\ \hline 89 \end{array}$	$\begin{array}{r} 22 \\ 31 \\ +43 \\ \hline 96 \end{array}$	$\begin{array}{r} 11 \\ 35 \\ +32 \\ \hline 78 \end{array}$
3.	$\begin{array}{r} 78 \\ 9 \\ +5 \\ \hline 92 \end{array}$	$\begin{array}{r} 36 \\ 8 \\ +7 \\ \hline 51 \end{array}$	$\begin{array}{r} 5 \\ 45 \\ +6 \\ \hline 56 \end{array}$	$\begin{array}{r} 7 \\ 8 \\ +61 \\ \hline 76 \end{array}$
4.	$\begin{array}{r} 35 \\ -15 \\ \hline 20 \end{array}$	$\begin{array}{r} 26 \\ -12 \\ \hline 14 \end{array}$	$\begin{array}{r} 19 \\ +26 \\ \hline 45 \end{array}$	$\begin{array}{r} 15 \\ -10 \\ \hline 5 \end{array}$

Part 2 Write *foot*, *inch*, *cup*, *pound*, *ounce*, or *quart*, whichever you would use in measuring the objects below.

1



inch

2



foot

3



quart

4



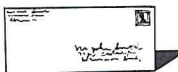
cup

5



pound

6



ounce

Part 3 Read each story problem and solve it.

1. George saved 14¢ last week, and 8¢ this week. How much money did he save in the two weeks? $14+8=$ 22¢

2. Nancy has a board 17 inches long. She sawed off 8 inches. How many inches of board are left? $17-8=\square$ 9 inches

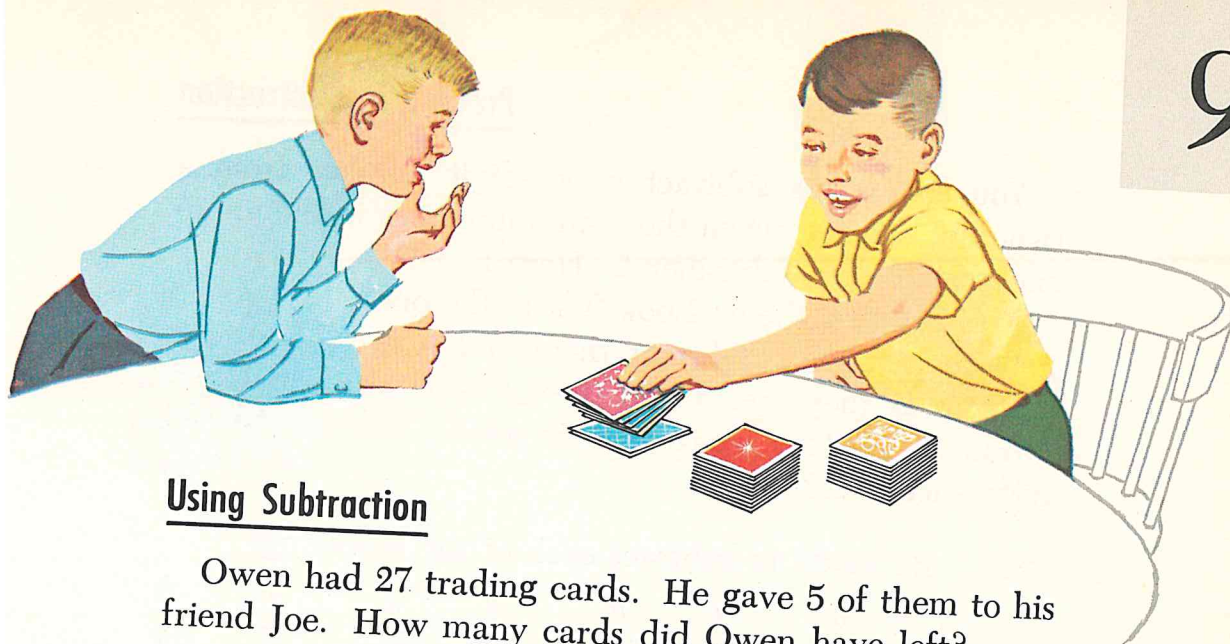
3. Paul spent 89¢ for a book and 8¢ for a cooky. How much did he spend for both? $89+8=\square$ 97¢

4. Joan had 10 problems to work. She has worked 7 problems. How many has she yet to work? $10-7=\square$ 3 problems

5. Don spent 75¢ for a dog dish and 6¢ for a bag of candy. How much did he spend in all? $75+6=\square$ 81¢

6. Jane bought a stamp for 3¢, a pencil for 4¢, and paper for 8¢. How much money did she spend? $3+4+8=\square$ 15¢

7. Mike spent 46¢ for a toothbrush and 7¢ for some candy. How much did he spend? $46+7=$ 53¢



Using Subtraction

Owen had 27 trading cards. He gave 5 of them to his friend Joe. How many cards did Owen have left?

You are to think of the set of 27 cards as being taken apart, so you subtract the numbers. In the language of arithmetic, the problem becomes $27 - 5 = \square$.

You may be able to think the difference in one step: $27 - 5 = 22$, or you may do the subtraction using pencil and paper. The picture below shows how to subtract.

TT (XXXXX) XX
 TT XX

2 tens 7 ones
 — 5 ones
 2 tens 2 ones

T | 0
 27
 — 5
 22

27
 — 5
 22

At the left above, T stands for ten and X stands for one. How many tens and ones are in the minuend? In the subtrahend? In the difference? Do you see that $7 \text{ ones} - 5 \text{ ones} = 2 \text{ ones}$? On the grid, where do you write the 2 ones? What do you do with the 2 tens? Do $2 \text{ tens} + 2 \text{ ones} = 22$? The difference is 22.

Practice in Subtraction

You sometimes subtract a one-digit number from a two-digit number when there are more ones in the minuend than in the subtrahend. Here is a fast way to subtract them. Look first at the ones in both numbers. Subtract them and leave the tens as they are. In $29 - 6 = \square$, subtract 6 from 9. No tens are to be subtracted. The difference is 23.

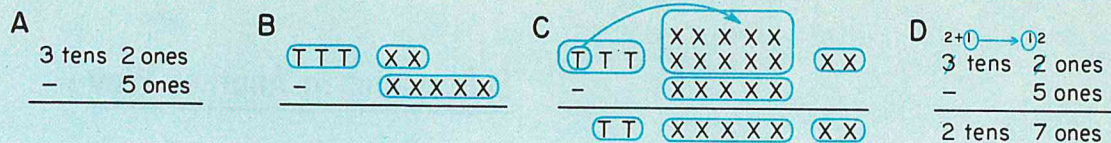
T	O	
2	9	29
<u>-</u> 6	<u>-</u> 6	<u>-</u> 6
2	3	23

Oral Be ready to subtract each of the following.

	<i>a</i>	<i>b</i>	<i>c</i>	<i>d</i>	<i>e</i>	<i>f</i>	<i>g</i>	<i>h</i>
1.	$\begin{array}{r} 6 \\ -2 \\ \hline 4 \end{array}$	$\begin{array}{r} 36 \\ -2 \\ \hline 34 \end{array}$	$\begin{array}{r} 4 \\ -3 \\ \hline 1 \end{array}$	$\begin{array}{r} 24 \\ -3 \\ \hline 21 \end{array}$	$\begin{array}{r} 8 \\ -4 \\ \hline 4 \end{array}$	$\begin{array}{r} 68 \\ -4 \\ \hline 64 \end{array}$	$\begin{array}{r} 4 \\ -4 \\ \hline 0 \end{array}$	$\begin{array}{r} 54 \\ -4 \\ \hline 50 \end{array}$
2.	$\begin{array}{r} 6 \\ -1 \\ \hline 5 \end{array}$	$\begin{array}{r} 96 \\ -1 \\ \hline 95 \end{array}$	$\begin{array}{r} 7 \\ -1 \\ \hline 6 \end{array}$	$\begin{array}{r} 77 \\ -1 \\ \hline 76 \end{array}$	$\begin{array}{r} 5 \\ -4 \\ \hline 1 \end{array}$	$\begin{array}{r} 35 \\ -4 \\ \hline 31 \end{array}$	$\begin{array}{r} 5 \\ -2 \\ \hline 3 \end{array}$	$\begin{array}{r} 65 \\ -2 \\ \hline 63 \end{array}$
3.	$\begin{array}{r} 8 \\ -5 \\ \hline 3 \end{array}$	$\begin{array}{r} 48 \\ -5 \\ \hline 43 \end{array}$	$\begin{array}{r} 9 \\ -6 \\ \hline 3 \end{array}$	$\begin{array}{r} 89 \\ -6 \\ \hline 83 \end{array}$	$\begin{array}{r} 6 \\ -3 \\ \hline 3 \end{array}$	$\begin{array}{r} 56 \\ -3 \\ \hline 53 \end{array}$	$\begin{array}{r} 4 \\ -2 \\ \hline 2 \end{array}$	$\begin{array}{r} 74 \\ -2 \\ \hline 72 \end{array}$

Written Copy. Write each difference.

	<i>a</i>	<i>b</i>	<i>c</i>	<i>d</i>	<i>e</i>	<i>f</i>	<i>g</i>	<i>h</i>
1.	$\begin{array}{r} 6 \\ -2 \\ \hline 4 \end{array}$	$\begin{array}{r} 16 \\ -2 \\ \hline 14 \end{array}$	$\begin{array}{r} 26 \\ -2 \\ \hline 24 \end{array}$	$\begin{array}{r} 36 \\ -2 \\ \hline 34 \end{array}$	$\begin{array}{r} 46 \\ -2 \\ \hline 44 \end{array}$	$\begin{array}{r} 56 \\ -2 \\ \hline 54 \end{array}$	$\begin{array}{r} 66 \\ -2 \\ \hline 64 \end{array}$	$\begin{array}{r} 76 \\ -2 \\ \hline 74 \end{array}$
2.	$\begin{array}{r} 9 \\ -4 \\ \hline 5 \end{array}$	$\begin{array}{r} 19 \\ -4 \\ \hline 15 \end{array}$	$\begin{array}{r} 29 \\ -4 \\ \hline 25 \end{array}$	$\begin{array}{r} 89 \\ -4 \\ \hline 85 \end{array}$	$\begin{array}{r} 69 \\ -4 \\ \hline 65 \end{array}$	$\begin{array}{r} 79 \\ -4 \\ \hline 75 \end{array}$	$\begin{array}{r} 99 \\ -4 \\ \hline 95 \end{array}$	$\begin{array}{r} 59 \\ -4 \\ \hline 55 \end{array}$
3.	$\begin{array}{r} 8 \\ -5 \\ \hline 3 \end{array}$	$\begin{array}{r} 18 \\ -5 \\ \hline 13 \end{array}$	$\begin{array}{r} 38 \\ -5 \\ \hline 33 \end{array}$	$\begin{array}{r} 68 \\ -5 \\ \hline 63 \end{array}$	$\begin{array}{r} 98 \\ -5 \\ \hline 93 \end{array}$	$\begin{array}{r} 48 \\ -5 \\ \hline 43 \end{array}$	$\begin{array}{r} 78 \\ -5 \\ \hline 73 \end{array}$	$\begin{array}{r} 58 \\ -5 \\ \hline 53 \end{array}$
4.	$\begin{array}{r} 7 \\ -4 \\ \hline 3 \end{array}$	$\begin{array}{r} 17 \\ -4 \\ \hline 13 \end{array}$	$\begin{array}{r} 97 \\ -4 \\ \hline 93 \end{array}$	$\begin{array}{r} 77 \\ -4 \\ \hline 73 \end{array}$	$\begin{array}{r} 57 \\ -4 \\ \hline 53 \end{array}$	$\begin{array}{r} 67 \\ -4 \\ \hline 63 \end{array}$	$\begin{array}{r} 37 \\ -4 \\ \hline 33 \end{array}$	$\begin{array}{r} 47 \\ -4 \\ \hline 43 \end{array}$



Changing the Form of a Ten in Subtraction

Philip has 32 marbles. Carl has 5 marbles. How many more marbles has Philip than Carl?

You are to find the difference between the numbers of the sets of marbles. You can find the difference by subtracting. The arithmetic statement is $32 - 5 = \square$.

Look at A and B above. You can see that 5 ones are more than 2 ones. Can you subtract 5 ones from 2 ones?

Look at C and D above. You can think of 3 tens as 2 tens + 1 ten. Then you can change the form of 1 ten to 10 ones and add it to the 2 ones. How many tens are left? 10 ones + 2 ones are how many ones? Can you subtract 5 ones from 12 ones?

Subtract as on the grid.

Ones: 12 ones - 5 ones = 7 ones. Write 7 in the ones place in the difference.

Tens: There are no tens to subtract. Write 2 in the tens place. The difference is 2 tens and 7 ones, or 27.

T	O	
3	2	32
— 5		— 5
2	7	27

Oral Read. Tell how you would find each difference.

See preceding paragraphs.

a	b	c	d	e	f	g
23	64	32	92	52	43	93
— 6	— 7	— 8	— 7	— 3	— 8	— 5
17	57	24	85	49	35	88

Written Copy a through g. Write each difference.

See above.

Subtracting in Another Way

You can often save time by subtracting in your head. $10-8=2$. What is $20-8$? $30-8$? $40-8$?

You can use such facts as those above in doing subtractions in two steps.

To subtract 8 from 24, begin by subtracting enough of the 8 from 24 to make 20. $24-4=20$. Then subtract the rest of the 8 from 20. $20-4=16$. Do you see that $(24-4)-4=16$ and that $24-8=16$?

The steps for some other subtractions are shown below.

<i>Statement</i>	<i>Think</i>		<i>Write</i>
$34-8=\square$	$34-4=30$	$30-4=26$	$34-8=26$
$53-7=\square$	$53-3=50$	$50-4=46$	$53-7=46$
$72-6=\square$	$72-2=70$	$70-4=66$	$72-6=66$

Oral Read. Tell each difference.

- | | | | |
|-------------------------------|----------------------------|----------------------------|----------------------------|
| <i>a</i>
1. $20-4=\square$ | <i>b</i>
$30-2=\square$ | <i>c</i>
$40-5=\square$ | <i>d</i>
$50-2=\square$ |
| $23-7=\square$ | $35-7=\square$ | $42-7=\square$ | $57-9=\square$ |

Written Copy. Write each difference.

- | | | | |
|-------------------------------|----------------------------|----------------------------|----------------------------|
| <i>a</i>
1. $45-7=\square$ | <i>b</i>
$24-8=\square$ | <i>c</i>
$42-7=\square$ | <i>d</i>
$73-6=\square$ |
| $92-7=\square$ | $32-8=\square$ | $64-6=\square$ | $50-7=\square$ |
| $44-6=\square$ | $24-7=\square$ | $35-6=\square$ | $33-9=\square$ |

Subtracting Two-Digit Numbers

Sometimes you will need to subtract in statements like $95 - 72 = \square$. Look at the picture at the right. τ means tens. o means ones.

$\begin{array}{r} 9 \text{ tens } 5 \text{ ones} \\ - 7 \text{ tens } 2 \text{ ones} \\ \hline 2 \text{ tens } 3 \text{ ones} \end{array}$	$\begin{array}{r} \tau o \\ 95 \\ - 72 \\ \hline 23 \end{array}$	$\begin{array}{r} 95 \\ - 72 \\ \hline 23 \end{array}$
--	--	--

You subtract 72 from 95 as follows:

Ones: 5 ones $-$ 2 ones = 3 ones. Write 3.

Tens: 9 tens $-$ 7 tens = 2 tens. Write 2.

The difference is 2 tens and 3 ones, or 23. Do you see that you can subtract tens as you subtract ones?

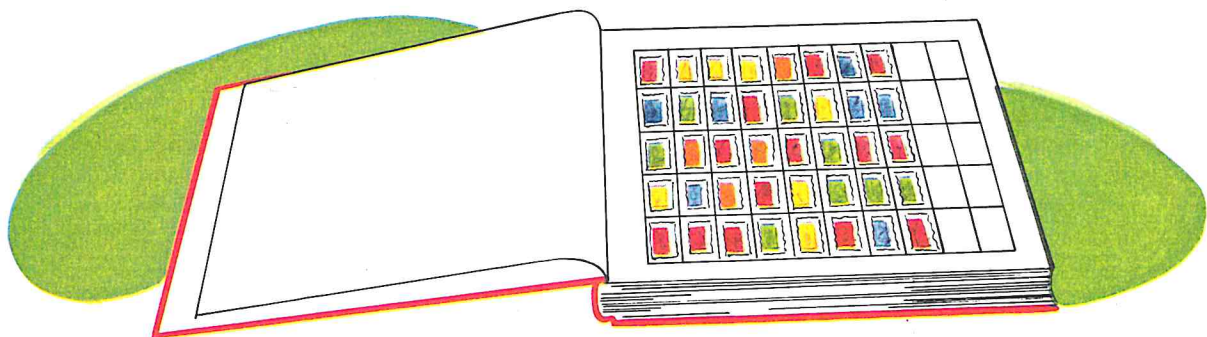
In the subtraction shown at the right, the difference is 0 tens and 3 ones. You do not write 0 in the tens place because you do not begin a numeral with 0. The difference is 3. $95 - 92 = 3$.

$$\begin{array}{r} 95 \\ - 92 \\ \hline 3 \end{array}$$

Oral Read. Tell each difference in rows 1 and 2.

	<i>a</i>	<i>b</i>	<i>c</i>	<i>d</i>	<i>e</i>	<i>f</i>	<i>g</i>	<i>h</i>
1.	$\begin{array}{r} 58 \\ - 34 \\ \hline 24 \end{array}$	$\begin{array}{r} 49 \\ - 37 \\ \hline 12 \end{array}$	$\begin{array}{r} 68 \\ - 37 \\ \hline 31 \end{array}$	$\begin{array}{r} 36 \\ - 24 \\ \hline 12 \end{array}$	$\begin{array}{r} 71 \\ - 61 \\ \hline 10 \end{array}$	$\begin{array}{r} 92 \\ - 81 \\ \hline 11 \end{array}$	$\begin{array}{r} 84 \\ - 63 \\ \hline 21 \end{array}$	$\begin{array}{r} 63 \\ - 52 \\ \hline 11 \end{array}$
2.	$\begin{array}{r} 59 \\ - 13 \\ \hline 46 \end{array}$	$\begin{array}{r} 97 \\ - 23 \\ \hline 74 \end{array}$	$\begin{array}{r} 36 \\ - 11 \\ \hline 25 \end{array}$	$\begin{array}{r} 89 \\ - 57 \\ \hline 32 \end{array}$	$\begin{array}{r} 68 \\ - 12 \\ \hline 56 \end{array}$	$\begin{array}{r} 49 \\ - 21 \\ \hline 28 \end{array}$	$\begin{array}{r} 99 \\ - 32 \\ \hline 67 \end{array}$	$\begin{array}{r} 98 \\ - 53 \\ \hline 45 \end{array}$
3.	$\begin{array}{r} 95 \\ - 73 \\ \hline 22 \end{array}$	$\begin{array}{r} 95 \\ - 65 \\ \hline 30 \end{array}$	$\begin{array}{r} 56 \\ - 44 \\ \hline 12 \end{array}$	$\begin{array}{r} 85 \\ - 64 \\ \hline 21 \end{array}$	$\begin{array}{r} 79 \\ - 43 \\ \hline 36 \end{array}$	$\begin{array}{r} 59 \\ - 36 \\ \hline 23 \end{array}$	$\begin{array}{r} 89 \\ - 41 \\ \hline 48 \end{array}$	$\begin{array}{r} 73 \\ - 43 \\ \hline 30 \end{array}$

Written Copy rows 1 through 3 above. Write each difference. Check. See above.



Using Subtraction to Solve Problems

Read the following story problems. Find out the story that is told. Pay special attention to the question. Subtract the numbers if a group, or set, is to be taken apart. Also subtract if you are to find by how many one set differs from another.

Oral Tell how you would write each of the following problems in order to solve it. Tell how you decided.

See T130 for additional answers.

1. Ann has saved 69¢. She spent 5¢ for candy. How many cents did she have left? $69 - 5 = \square$ 64¢
2. Lon had 50 stamps. He lost 10 stamps. How many stamps did he have left? $50 - 10 = \square$ 40 stamps
3. One bus had seats for 24 children. Another bus had seats for 56 children. How many more seats were there in the larger bus than in the smaller bus? $56 - 24 = \square$ 32 seats
4. Phyllis had 55¢. She paid 23¢ for apples. How much money should she have left? $55 - 23 = \square$ 32¢
5. Karen made 36 cookies. She and her friends ate 4 cookies. How many cookies were not eaten? $36 - 4 = \square$ 32 cookies

Written Solve problems 1 through 5 above. Check each answer carefully. See above.

Checking Subtraction

Betty had 48 books. Mary Jo had 25 books. How many more books did Betty have than Mary Jo?

You are to find the difference between the numbers of the sets of books. You can find the difference by subtracting. Write $48 - 25 = \square$ and subtract as follows.

Ones: 8 ones - 5 ones = 3 ones.

Tens: 4 tens - 2 tens = 2 tens.

The difference is 23. Betty had 23 more books than Mary Jo.

You have already seen that subtraction is the inverse operation of addition and can be used to undo addition. Now notice that the reverse is also true. Addition is the inverse operation of subtraction and can be used to undo subtraction as shown above. Thus, to check subtraction, add the *difference* to the *subtrahend* and see if the sum is the *minuend*.

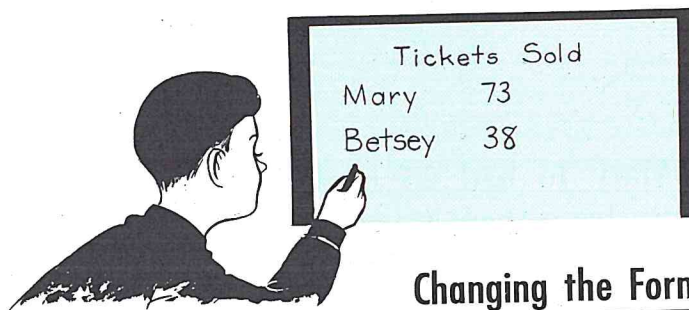
$$\begin{array}{r}
 48 \text{ minuend} \\
 -25 \text{ subtrahend} \\
 \hline
 23 \text{ difference}
 \end{array}$$

$$\begin{array}{r}
 48 \\
 -25 \\
 \hline
 23 \\
 +25 \\
 \hline
 48
 \end{array}$$

Oral Read. Find each difference in rows 1 and 2. Tell what numbers you will add to check your answer. **Add subtrahend to difference.**

	a	b	c	d	e	f	g
1.	$\begin{array}{r} 56 \\ -33 \\ \hline 23 \end{array}$	$\begin{array}{r} 98 \\ -55 \\ \hline 43 \end{array}$	$\begin{array}{r} 58 \\ -34 \\ \hline 24 \end{array}$	$\begin{array}{r} 29 \\ -19 \\ \hline 10 \end{array}$	$\begin{array}{r} 48 \\ -13 \\ \hline 35 \end{array}$	$\begin{array}{r} 59 \\ -44 \\ \hline 15 \end{array}$	$\begin{array}{r} 87 \\ -25 \\ \hline 62 \end{array}$
2.	$\begin{array}{r} 98 \\ -36 \\ \hline 62 \end{array}$	$\begin{array}{r} 35 \\ -24 \\ \hline 11 \end{array}$	$\begin{array}{r} 49 \\ -27 \\ \hline 22 \end{array}$	$\begin{array}{r} 26 \\ -16 \\ \hline 10 \end{array}$	$\begin{array}{r} 39 \\ -15 \\ \hline 24 \end{array}$	$\begin{array}{r} 86 \\ -64 \\ \hline 22 \end{array}$	$\begin{array}{r} 72 \\ -52 \\ \hline 20 \end{array}$

Written Copy rows 1 and 2. Write each difference. Check by adding the difference to the subtrahend. **See above.**



Changing the Form of a Ten in Subtraction

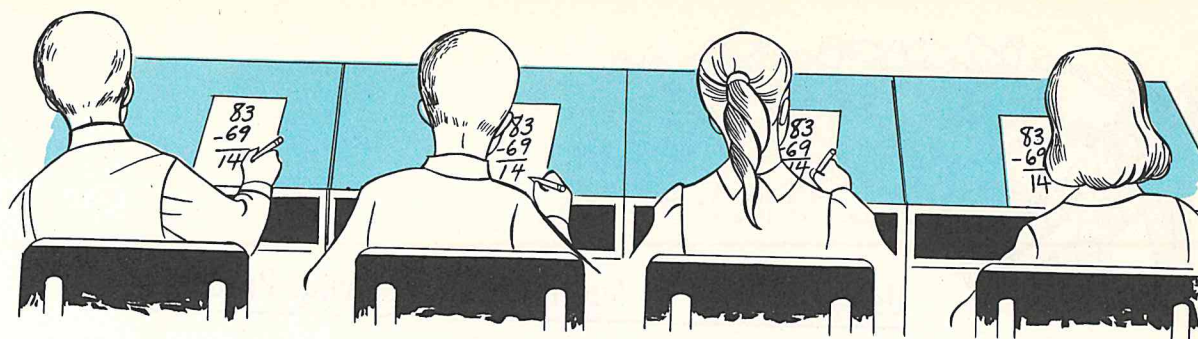
Mary sold 73 tickets for the school fair. Betsey sold 38 tickets. How many more tickets did Mary sell than Betsey sold?

Because you are to think of the numbers of the sets of tickets as being compared to find the difference, you subtract the numbers. First write the story problem in the language of arithmetic, like this: $73 - 38 = \square$. Then subtract as shown below.

A	B	C	D
$\begin{array}{r} 7 \text{ tens } 3 \text{ ones} \\ - 3 \text{ tens } 8 \text{ ones} \\ \hline \end{array}$	$\begin{array}{r} \overset{6+1}{7} \text{ tens } \rightarrow 13 \text{ ones} \\ - 3 \text{ tens } 8 \text{ ones} \\ \hline 3 \text{ tens } 5 \text{ ones} \end{array}$	$\begin{array}{r} \text{T} \text{O} \\ \hline \overset{6}{7} \overset{13}{3} \\ - 38 \\ \hline 35 \end{array}$	$\begin{array}{r} 73 \\ - 38 \\ \hline 35 \end{array}$

In A above, can you subtract 8 ones from 3 ones? In B, 7 tens can be thought of as 6 tens + 1 ten. Now you can change the form of 1 ten to 10 ones and add it to the 3 ones. $10 \text{ ones} + 3 \text{ ones} = 13 \text{ ones}$. Can you subtract 8 ones from 13 ones? Can you subtract 3 tens from 6 tens? How many tens and ones are in the difference?

The grid in C shows that the difference is 3 tens and 5 ones. (The small numerals in the grid are written as a reminder.) The statement $73 - 38 = 35$ may be written in column form as in D.



Oral Read. Be ready to give each difference and to tell how you found the difference. See p. 132.

	<i>a</i>	<i>b</i>	<i>c</i>	<i>d</i>	<i>e</i>	<i>f</i>	<i>g</i>
1.	$\begin{array}{r} 83 \\ -69 \\ \hline 14 \end{array}$	$\begin{array}{r} 95 \\ -36 \\ \hline 59 \end{array}$	$\begin{array}{r} 82 \\ -48 \\ \hline 34 \end{array}$	$\begin{array}{r} 74 \\ -59 \\ \hline 15 \end{array}$	$\begin{array}{r} 80 \\ -19 \\ \hline 61 \end{array}$	$\begin{array}{r} 52 \\ -39 \\ \hline 13 \end{array}$	$\begin{array}{r} 84 \\ -37 \\ \hline 47 \end{array}$
2.	$\begin{array}{r} 47 \\ -38 \\ \hline 9 \end{array}$	$\begin{array}{r} 33 \\ -26 \\ \hline 7 \end{array}$	$\begin{array}{r} 74 \\ -67 \\ \hline 7 \end{array}$	$\begin{array}{r} 58 \\ -49 \\ \hline 9 \end{array}$	$\begin{array}{r} 86 \\ -79 \\ \hline 7 \end{array}$	$\begin{array}{r} 92 \\ -84 \\ \hline 8 \end{array}$	$\begin{array}{r} 25 \\ -17 \\ \hline 8 \end{array}$

Written Copy. Write each difference. Check.

	<i>a</i>	<i>b</i>	<i>c</i>	<i>d</i>	<i>e</i>	<i>f</i>	<i>g</i>
1.	$\begin{array}{r} 37 \\ -19 \\ \hline 18 \end{array}$	$\begin{array}{r} 63 \\ -47 \\ \hline 16 \end{array}$	$\begin{array}{r} 34 \\ -15 \\ \hline 19 \end{array}$	$\begin{array}{r} 43 \\ -14 \\ \hline 29 \end{array}$	$\begin{array}{r} 82 \\ -47 \\ \hline 35 \end{array}$	$\begin{array}{r} 61 \\ -44 \\ \hline 17 \end{array}$	$\begin{array}{r} 92 \\ -79 \\ \hline 13 \end{array}$
2.	$\begin{array}{r} 70 \\ -29 \\ \hline 41 \end{array}$	$\begin{array}{r} 52 \\ -25 \\ \hline 27 \end{array}$	$\begin{array}{r} 56 \\ -38 \\ \hline 18 \end{array}$	$\begin{array}{r} 95 \\ -78 \\ \hline 17 \end{array}$	$\begin{array}{r} 46 \\ -28 \\ \hline 18 \end{array}$	$\begin{array}{r} 54 \\ -29 \\ \hline 25 \end{array}$	$\begin{array}{r} 53 \\ -16 \\ \hline 37 \end{array}$
3.	$\begin{array}{r} 27 \\ -19 \\ \hline 8 \end{array}$	$\begin{array}{r} 53 \\ -44 \\ \hline 9 \end{array}$	$\begin{array}{r} 26 \\ -19 \\ \hline 7 \end{array}$	$\begin{array}{r} 74 \\ -65 \\ \hline 9 \end{array}$	$\begin{array}{r} 32 \\ -28 \\ \hline 4 \end{array}$	$\begin{array}{r} 96 \\ -87 \\ \hline 9 \end{array}$	$\begin{array}{r} 27 \\ -19 \\ \hline 8 \end{array}$
4.	$\begin{array}{r} 83 \\ -27 \\ \hline 56 \end{array}$	$\begin{array}{r} 88 \\ -49 \\ \hline 39 \end{array}$	$\begin{array}{r} 96 \\ -29 \\ \hline 67 \end{array}$	$\begin{array}{r} 62 \\ -43 \\ \hline 19 \end{array}$	$\begin{array}{r} 93 \\ -75 \\ \hline 18 \end{array}$	$\begin{array}{r} 68 \\ -49 \\ \hline 19 \end{array}$	$\begin{array}{r} 80 \\ -79 \\ \hline 1 \end{array}$

A quick review

	<i>a</i>	<i>b</i>	<i>c</i>	<i>d</i>
1.	$12 + 79 = \square$	$41 + 44 = \square$	$32 + 47 = \square$	$43 + 14 = \square$
2.	$37 + 26 = \square$	$23 + 12 = \square$	$44 + 25 = \square$	$72 + 16 = \square$

MORE PRACTICE
 PAGE 308

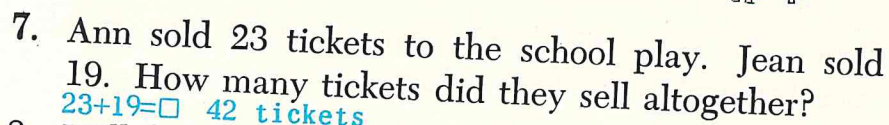


Using Addition or Subtraction in Solving Problems

Read each story problem. Pay special attention to the question. If sets are to be thought of as put together, you are to add the numbers of the sets. If sets are to be taken apart, or if you are to find out by how many one set differs from another, subtract the numbers of the sets.

Oral Read. Tell the arithmetic statement you would use in solving each problem. Tell why you decided to use it. See T135 for additional answers.

1. Dan and his mother went to visit his uncle's farm. They went 45 miles by train and 18 miles by bus. How far did they travel altogether? $45+18=\square$ 63 miles
2. The train trip took 58 minutes. The bus trip took 35 minutes. How much longer did the train trip take than the bus trip did? $58-35=\square$ 23 minutes
3. Dan's uncle had 32 pigs to sell. A butcher bought 15 of them. How many of the pigs were left? $32-15=\square$ 17 pigs
4. There were 75 chickens ready to sell. The butcher bought 48 of them. How many were left? $75-48=\square$ 27 chickens
5. Dan's uncle had 47 sheep in one flock, and 29 sheep in another flock. How many sheep did he have altogether? $47+29=\square$ 76 sheep
6. Tim is 58 inches tall. Alvin is 56 inches tall. How much shorter than Tim is Alvin? $58-56=\square$ 2 inches



8. Will has read 58 pages of a 96-page book. How many pages has he yet to read? $96-58=\square$ 38 pages
9. Sidney's mother bought a loaf of bread for 21 cents and a pie for 49 cents. How much did she pay altogether? $21+49=\square$ 70 cents
10. A farmer had 83 cows. If he sold 37 of them, how many cows would he have left? $83-37=\square$ 46 cows
11. Wilma read 36 pages of a book yesterday and 27 pages today. How many pages of the book did she read altogether? $36+27=\square$ 63 pages
12. John has saved 83 stamps. Of these, 65 are United States stamps. How many are from other lands? $83-65=\square$ 18 stamps

Written Write the arithmetic statement for problems 1 through 12. Find the missing number. *See above.*

A quick review

	<i>a</i>	<i>b</i>	<i>c</i>	<i>d</i>	<i>e</i>	<i>f</i>	<i>g</i>	<i>h</i>
1.	$\begin{array}{r} 28 \\ +5 \\ \hline 33 \end{array}$	$\begin{array}{r} 39 \\ +4 \\ \hline 43 \end{array}$	$\begin{array}{r} 28 \\ +3 \\ \hline 31 \end{array}$	$\begin{array}{r} 18 \\ +4 \\ \hline 22 \end{array}$	$\begin{array}{r} 34 \\ +9 \\ \hline 43 \end{array}$	$\begin{array}{r} 86 \\ +9 \\ \hline 95 \end{array}$	$\begin{array}{r} 28 \\ +8 \\ \hline 36 \end{array}$	$\begin{array}{r} 39 \\ +2 \\ \hline 41 \end{array}$
2.	$\begin{array}{r} 49 \\ -9 \\ \hline 40 \end{array}$	$\begin{array}{r} 42 \\ -4 \\ \hline 38 \end{array}$	$\begin{array}{r} 34 \\ -6 \\ \hline 28 \end{array}$	$\begin{array}{r} 55 \\ -9 \\ \hline 46 \end{array}$	$\begin{array}{r} 39 \\ -8 \\ \hline 31 \end{array}$	$\begin{array}{r} 46 \\ -8 \\ \hline 38 \end{array}$	$\begin{array}{r} 25 \\ -6 \\ \hline 19 \end{array}$	$\begin{array}{r} 62 \\ -9 \\ \hline 53 \end{array}$

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Reviewing Addition and Subtraction

Spend time learning addition and subtraction combinations you do not know. Using your practice cards will help you learn them.

Oral See how quickly you can say each sum or difference for each statement below.

<i>a</i>	<i>b</i>	<i>c</i>	<i>d</i>
1. $6+9=\square$ ¹⁵	$15-9=\square$ ⁶	$6+3=\square$ ⁹	$9-3=\square$ ⁶
2. $5+5=\square$ ¹⁰	$10-5=\square$ ⁵	$6+8=\square$ ¹⁴	$14-8=\square$ ⁶
3. $4+9=\square$ ¹³	$13-9=\square$ ⁴	$5+9=\square$ ¹⁴	$14-9=\square$ ⁵
4. $6+7=\square$ ¹³	$13-7=\square$ ⁶	$6+5=\square$ ¹¹	$11-5=\square$ ⁶
5. $4+4=\square$ ⁸	$8-4=\square$ ⁴	$3+2=\square$ ⁵	$5-2=\square$ ³
6. $6+4=\square$ ¹⁰	$10-4=\square$ ⁶	$6+3=\square$ ⁹	$9-3=\square$ ⁶
7. $8+1=\square$ ⁹	$9-1=\square$ ⁸	$9+2=\square$ ¹¹	$11-2=\square$ ⁹
8. $7+6=\square$ ¹³	$13-6=\square$ ⁷	$7+5=\square$ ¹²	$12-5=\square$ ⁷
9. $9+4=\square$ ¹³	$13-4=\square$ ⁹	$8+4=\square$ ¹²	$12-4=\square$ ⁸
10. $9+9=\square$ ¹⁸	$18-9=\square$ ⁹	$7+9=\square$ ¹⁶	$16-9=\square$ ⁷
11. $7+3=\square$ ¹⁰	$10-3=\square$ ⁷	$8+8=\square$ ¹⁶	$16-8=\square$ ⁸
12. $8+7=\square$ ¹⁵	$15-7=\square$ ⁸	$8+5=\square$ ¹³	$13-5=\square$ ⁸
13. $9+1=\square$ ¹⁰	$10-1=\square$ ⁹	$9+6=\square$ ¹⁵	$15-6=\square$ ⁹
14. $7+8=\square$ ¹⁵	$15-8=\square$ ⁷	$8+6=\square$ ¹⁴	$14-6=\square$ ⁸
15. $7+2=\square$ ⁹	$9-2=\square$ ⁷	$8+9=\square$ ¹⁷	$17-9=\square$ ⁸
16. $8+3=\square$ ¹¹	$11-3=\square$ ⁸	$7+4=\square$ ¹¹	$11-4=\square$ ⁷

Written Copy. Write the answers. Watch the signs.

	<i>a</i>	<i>b</i>	<i>c</i>	<i>d</i>	<i>e</i>	<i>f</i>	<i>g</i>
1.	$\begin{array}{r} 10 \\ -6 \\ \hline 4 \end{array}$	$\begin{array}{r} 12 \\ +7 \\ \hline 19 \end{array}$	$\begin{array}{r} 12 \\ -9 \\ \hline 3 \end{array}$	$\begin{array}{r} 67 \\ +2 \\ \hline 69 \end{array}$	$\begin{array}{r} 12 \\ -3 \\ \hline 9 \end{array}$	$\begin{array}{r} 18 \\ -9 \\ \hline 9 \end{array}$	$\begin{array}{r} 83 \\ +5 \\ \hline 88 \end{array}$
2.	$\begin{array}{r} 35 \\ +4 \\ \hline 39 \end{array}$	$\begin{array}{r} 17 \\ -9 \\ \hline 8 \end{array}$	$\begin{array}{r} 10 \\ -7 \\ \hline 3 \end{array}$	$\begin{array}{r} 76 \\ +4 \\ \hline 80 \end{array}$	$\begin{array}{r} 11 \\ -4 \\ \hline 7 \end{array}$	$\begin{array}{r} 10 \\ -8 \\ \hline 2 \end{array}$	$\begin{array}{r} 15 \\ -7 \\ \hline 8 \end{array}$
3.	$\begin{array}{r} 15 \\ +9 \\ \hline 24 \end{array}$	$\begin{array}{r} 17 \\ -8 \\ \hline 9 \end{array}$	$\begin{array}{r} 54 \\ +7 \\ \hline 61 \end{array}$	$\begin{array}{r} 11 \\ -9 \\ \hline 2 \end{array}$	$\begin{array}{r} 84 \\ +9 \\ \hline 93 \end{array}$	$\begin{array}{r} 10 \\ -5 \\ \hline 5 \end{array}$	$\begin{array}{r} 48 \\ +3 \\ \hline 51 \end{array}$
4.	$\begin{array}{r} 3 \\ 6 \\ +7 \\ \hline 16 \end{array}$	$\begin{array}{r} 8 \\ 0 \\ +2 \\ \hline 10 \end{array}$	$\begin{array}{r} 8 \\ 3 \\ +5 \\ \hline 16 \end{array}$	$\begin{array}{r} 7 \\ 4 \\ +4 \\ \hline 15 \end{array}$	$\begin{array}{r} 6 \\ 4 \\ +7 \\ \hline 17 \end{array}$	$\begin{array}{r} 6 \\ 6 \\ +6 \\ \hline 18 \end{array}$	$\begin{array}{r} 3 \\ 5 \\ +6 \\ \hline 14 \end{array}$
5.	$\begin{array}{r} 28 \\ +33 \\ \hline 61 \end{array}$	$\begin{array}{r} 28 \\ +41 \\ \hline 69 \end{array}$	$\begin{array}{r} 48 \\ +47 \\ \hline 95 \end{array}$	$\begin{array}{r} 54 \\ +36 \\ \hline 90 \end{array}$	$\begin{array}{r} 19 \\ +59 \\ \hline 78 \end{array}$	$\begin{array}{r} 57 \\ +27 \\ \hline 84 \end{array}$	$\begin{array}{r} 45 \\ +35 \\ \hline 80 \end{array}$
6.	$\begin{array}{r} 16 \\ +46 \\ \hline 62 \end{array}$	$\begin{array}{r} 47 \\ +33 \\ \hline 80 \end{array}$	$\begin{array}{r} 79 \\ +17 \\ \hline 96 \end{array}$	$\begin{array}{r} 37 \\ +34 \\ \hline 71 \end{array}$	$\begin{array}{r} 15 \\ +37 \\ \hline 52 \end{array}$	$\begin{array}{r} 24 \\ +66 \\ \hline 90 \end{array}$	$\begin{array}{r} 35 \\ +38 \\ \hline 73 \end{array}$
7.	$\begin{array}{r} 31 \\ +29 \\ \hline 60 \end{array}$	$\begin{array}{r} 29 \\ +42 \\ \hline 71 \end{array}$	$\begin{array}{r} 48 \\ +37 \\ \hline 85 \end{array}$	$\begin{array}{r} 16 \\ +58 \\ \hline 74 \end{array}$	$\begin{array}{r} 19 \\ +73 \\ \hline 92 \end{array}$	$\begin{array}{r} 28 \\ +56 \\ \hline 84 \end{array}$	$\begin{array}{r} 37 \\ +58 \\ \hline 95 \end{array}$
8.	$\begin{array}{r} 48 \\ +12 \\ \hline 60 \end{array}$	$\begin{array}{r} 47 \\ +38 \\ \hline 85 \end{array}$	$\begin{array}{r} 76 \\ +17 \\ \hline 93 \end{array}$	$\begin{array}{r} 24 \\ +67 \\ \hline 91 \end{array}$	$\begin{array}{r} 65 \\ -28 \\ \hline 37 \end{array}$	$\begin{array}{r} 64 \\ -48 \\ \hline 16 \end{array}$	$\begin{array}{r} 49 \\ -49 \\ \hline 0 \end{array}$
9.	$\begin{array}{r} 92 \\ -84 \\ \hline 8 \end{array}$	$\begin{array}{r} 69 \\ -43 \\ \hline 26 \end{array}$	$\begin{array}{r} 79 \\ -57 \\ \hline 22 \end{array}$	$\begin{array}{r} 80 \\ -79 \\ \hline 1 \end{array}$	$\begin{array}{r} 53 \\ -44 \\ \hline 9 \end{array}$	$\begin{array}{r} 38 \\ -19 \\ \hline 19 \end{array}$	$\begin{array}{r} 27 \\ -23 \\ \hline 4 \end{array}$

Can you do this? Use the numerals 1, 4, 5, and 6. Use the symbols +, +, -, and -. Construct the numerals for the numbers one through seventeen, using 2, 3, or all 4 of the given numerals. Three examples are shown.

a
 $1 = 6 - 5$

b
 $6 = 1 + 5$

c
 $10 = 6 + 5 - 1$

See T137 for answers.

Using Addition and Subtraction in Problems

Read each problem carefully. See if you can solve the problems by yourself.

Written Solve each of these problems.

1. Peter is carrying 8 books to school this morning. Dan is carrying 4 books. How many more books is Peter carrying than Dan? $8-4=\square$ 4 books
2. David and his father are driving to a town that is 83 miles from their home. They have driven 47 miles. How far have they yet to go? $83-47=\square$ 36 miles
3. Mollie had 5¢ in her piggy bank. She found 3¢ in her apron pocket. Then how much money did Mollie have altogether? $5+3=\square$ 8¢
4. John spent 35¢ for a book, 14¢ for pencils, and 48¢ for a pencil case. How much did John spend for all the things he bought? $35+14+48=\square$ 97¢
5. George has saved 75¢. Mark has saved 58¢. How much more money has George saved than Mark has? $75-58=\square$ 17¢
6. There are 32 children in Sam's third grade class, and 29 in Jerry's third grade class. How many children in all are there in both classes? $32+29=\square$ 61 children
7. Susan brought 7 kittens to school on Tuesday. There were 3 black kittens among them. How many kittens were not black? $7-3=\square$ 4 kittens
8. Philip saw 3 white bears in the pool, 2 in the cave, and 4 lying on the rocks. How many white bears in all did he see? $3+2+4=\square$ 9 white bears

Checkup Time

The numerals in () tell the pages where you can turn for help if you need it.

Important Ideas

1. You subtract tens as you subtract ones. (129)

2. The difference plus the subtrahend equals the minuend because addition and subtraction are inverse operations. (131)

Questions to Discuss

See T139 for answers.

1. After you subtract 3 ones from 8 ones as at the right, what do you do with the tens? (125)

$$\begin{array}{r} 38 \\ -3 \\ \hline \end{array}$$

2. What must you do in the subtraction at the right to subtract the 6 ones? (127)

$$\begin{array}{r} 41 \\ -6 \\ \hline \end{array}$$

3. How can knowing $16 - 9 = 7$ help you do the subtraction at the right? (127)

$$\begin{array}{r} 46 \\ -9 \\ \hline \end{array}$$

4. What steps would you take in the subtraction at the right? (132)

$$\begin{array}{r} 46 \\ -27 \\ \hline \end{array}$$

Oral Practice

In each of these subtractions, be ready to tell the difference.

<i>a</i>	<i>b</i>	<i>c</i>
1. $\begin{array}{r} 47 \\ -6 \\ \hline 41 \end{array}$ (125)	$\begin{array}{r} 38 \\ -9 \\ \hline 29 \end{array}$ (127)	$\begin{array}{r} 86 \\ -23 \\ \hline 63 \end{array}$ (129)
2. $\begin{array}{r} 65 \\ -28 \\ \hline 37 \end{array}$ (132)	$\begin{array}{r} 33 \\ -24 \\ \hline 9 \end{array}$ (132)	$\begin{array}{r} 62 \\ -51 \\ \hline 11 \end{array}$ (132)

Written Practice

Solve each of these story problems. Write each answer. Check your work. (127, 132)

1. Janet had 73¢ in her piggy bank. She used 7¢ to buy candy. How much money did she have left? $73 - 7 = \square$ 66¢

2. There were 63 pupils at the third grade picnic. 38 of them were boys. How many were girls? $63 - 38 = \square$ 25 girls

3. Paul brought 71 balloons for the picnic. He gave away 63 of them. How many balloons did Paul have left? $71 - 63 = \square$ 8 balloons

Self-Evaluation

Part 1 Copy. Write each sum or difference. Check.

	<i>a</i>	<i>b</i>	<i>c</i>	<i>d</i>
1.	$\begin{array}{r} 4 \\ +3 \\ \hline 7 \end{array}$	$\begin{array}{r} 8 \\ +5 \\ \hline 13 \end{array}$	$\begin{array}{r} 6 \\ -3 \\ \hline 3 \end{array}$	$\begin{array}{r} 16 \\ +2 \\ \hline 18 \end{array}$
2.	$\begin{array}{r} 15 \\ -6 \\ \hline 9 \end{array}$	$\begin{array}{r} 38 \\ -6 \\ \hline 32 \end{array}$	$\begin{array}{r} 72 \\ -9 \\ \hline 63 \end{array}$	$\begin{array}{r} 70 \\ -5 \\ \hline 65 \end{array}$
3.	$\begin{array}{r} 2 \\ 4 \\ +3 \\ \hline 9 \end{array}$	$\begin{array}{r} 23 \\ 3 \\ +4 \\ \hline 30 \end{array}$	$\begin{array}{r} 25 \\ 4 \\ +9 \\ \hline 38 \end{array}$	$\begin{array}{r} 8 \\ 3 \\ +7 \\ \hline 18 \end{array}$
4.	$\begin{array}{r} 44 \\ 9 \\ +3 \\ \hline 56 \end{array}$	$\begin{array}{r} 10 \\ 20 \\ +10 \\ \hline 40 \end{array}$	$\begin{array}{r} 33 \\ 22 \\ +24 \\ \hline 79 \end{array}$	$\begin{array}{r} 37 \\ 17 \\ +39 \\ \hline 93 \end{array}$
5.	$\begin{array}{r} 27 \\ -8 \\ \hline 19 \end{array}$	$\begin{array}{r} 21 \\ +35 \\ \hline 56 \end{array}$	$\begin{array}{r} 63 \\ -58 \\ \hline 5 \end{array}$	$\begin{array}{r} 40 \\ -26 \\ \hline 14 \end{array}$
6.	$\begin{array}{r} 38 \\ +26 \\ \hline 64 \end{array}$	$\begin{array}{r} 57 \\ -24 \\ \hline 33 \end{array}$	$\begin{array}{r} 73 \\ -46 \\ \hline 27 \end{array}$	$\begin{array}{r} 56 \\ -27 \\ \hline 29 \end{array}$

Part 2 Copy each sentence below. Write the correct numeral in each blank space.

1. A yard is the same measure as 3 feet, or 36 inches.

2. There are 12 eggs in a dozen.

3. A pound of butter weighs the same as 16 ounces of butter.

Part 3 Solve problems 1 through 6 below.

1. Bernie had 7¢. His father gave him 2¢. How many cents did Bernie have then? $7+2=\square$
9¢

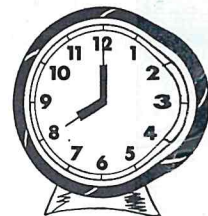
2. Marilyn counted 8 cookies on a plate. She ate 2 cookies. How many did she leave on the plate? $8-2=\square$ 6 cookies

3. Pete received 6 stamps to start a collection. He needs 24 stamps to fill a page. How many more stamps does he need?
 $24-6=\square$ 18 stamps

4. Jane packed 46 books in a large box. Dorothy packed 7 books. How many books were packed altogether? $46+7=\square$ 53 books

5. Paul put 10 books on the top shelf, 22 books on the middle shelf, and 39 on the bottom shelf. How many books did he put on all the shelves? $10+22+39=\square$
71 books

6. Susan got up at 7:20. She was dressed by 8:00. How long did it take Susan to dress?
40 minutes



Midyear Review

Answering the questions on this page will help you see how much you have learned in the first half of your book. The numerals in () tell where you can turn for help.

Numbers, Words, and Signs

1. What is the natural order of the numbers 1 through 9? (6)

1, 2, 3, 4, 5, 6, 7, 8, 9

2. Which signs below are used in an addition statement? (19)

a	b	c	d
\oplus	\oplus	$-$	ϕ

3. Which signs in a , b , c , and d above are used in writing a subtraction statement? (34)

b, c

4. Tell which word, *addend*, *sum*, *subtrahend*, *minuend*, or *difference*, belongs in each () below. (19, 39) See T141 for answers

34 (a)	81 (d)
$\begin{array}{r} +47 \\ \hline \end{array}$ (b)	$\begin{array}{r} -47 \\ \hline \end{array}$ (e)
81 (c)	34 (f)

Addition and Subtraction

See T141 for answers.

1. How does knowing the addition in a help you know the addition in b ? Why? (50, 52)

a	b
$4 + 8 = 12$	$8 + 4 = 12$

2. How does knowing the addition in a help you know the subtraction in b ? Why? (63, 65)

a	b
$4 + 8 = 12$	$12 - 8 = 4$

3. What steps do you take when you add in the addition at the right? (89, 96)

$$\begin{array}{r} 35 \\ 17 \\ +28 \\ \hline \end{array}$$

4. What steps do you take to subtract in the subtraction at the right? (132)

$$\begin{array}{r} 45 \\ -38 \\ \hline \end{array}$$

Problem Solving

See T141 for answers.

1. How do you decide whether to add or subtract to solve a problem? (22, 36, 40)

2. Use each arithmetic statement. Make up story problems for the class to solve. (95, 129)

a	b
$19 + 25 = \square$	$25 - 12 = \square$
$18 - \square = 9$	$\square - 7 = 8$

Midyear Test

Part 1 Copy these X's in order from left to right. Draw a circle around the 1st, 5th, and 9th X. The 1st is circled for you.

(X) X X X (X) X X X (X) X

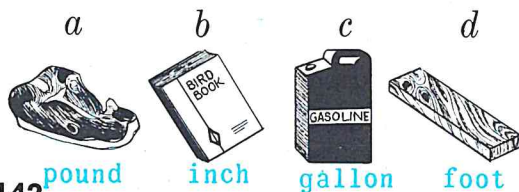
Part 2 Draw 4 grids. Write these two-digit numerals on the grids you drew.

a 10 $\begin{array}{r} \text{T}|0 \\ \hline 1|0 \end{array}$ *b* 33 $\begin{array}{r} \text{T}|0 \\ \hline 3|3 \end{array}$ *c* 97 $\begin{array}{r} \text{T}|0 \\ \hline 9|7 \end{array}$ *d* 56 $\begin{array}{r} \text{T}|0 \\ \hline 5|6 \end{array}$

Part 3 Copy. Write each sum or difference. Check.

<i>a</i>	<i>b</i>	<i>c</i>	<i>d</i>
1. $\begin{array}{r} 54 \\ +23 \\ \hline 77 \end{array}$	$\begin{array}{r} 65 \\ -34 \\ \hline 31 \end{array}$	$\begin{array}{r} 26 \\ +28 \\ \hline 54 \end{array}$	$\begin{array}{r} 74 \\ -36 \\ \hline 38 \end{array}$
2. $\begin{array}{r} 33 \\ 10 \\ +6 \\ \hline 49 \end{array}$	$\begin{array}{r} 57 \\ 8 \\ +13 \\ \hline 78 \end{array}$	$\begin{array}{r} 77 \\ 5 \\ +10 \\ \hline 92 \end{array}$	$\begin{array}{r} 41 \\ 26 \\ +15 \\ \hline 82 \end{array}$

Part 4 Write the standard unit of measure you would use to measure each of the following items. Choose from these words: degree, foot, cup, gallon, pound, inch.



Part 5 Decide whether you should add or subtract to solve each problem. Then solve it.

1. Susie bought 6 hard rolls and 3 sweet rolls at the bakery this morning. How many rolls did she buy altogether? **Add;**
 $6+3=\square$ 9 rolls

2. Ann needed 8 cups of milk to make cocoa. She had 5 cups of milk. How many more cups of milk did she need? **Subtract;**
 $8-5=\square$ 3 cups

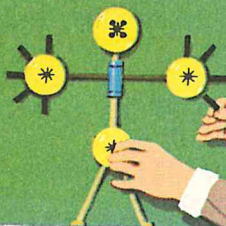
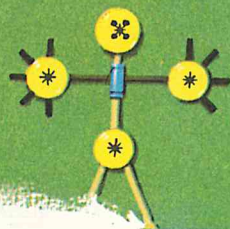
3. Of the 16 boys in our club, 9 can swim. How many of the boys cannot yet swim? **Subtract;**
 $16-9=\square$ 7 boys

4. Bill has 16 stamps. He needs 34 stamps to fill a page in his stamp album. How many more stamps does he need? **Subtract;**
 $34-16=\square$ 18 stamps

5. Paul spent 35¢ for a book, 14¢ for pencils, and 48¢ for a pencil case. How much did Paul spend for all the things he bought? **Add;** $35+48+14=\square$ 97¢

6. During Visitors' Week 32 first-grade mothers, 27 second-grade mothers, and 25 third-grade mothers visited the school. How many mothers visited? **Add;** $32+27+25=\square$ 84 mothers

$$9 \text{ tens} + 9 \text{ ones} = 99$$



The Number 100

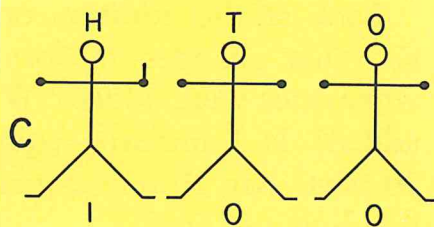
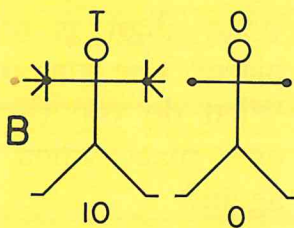
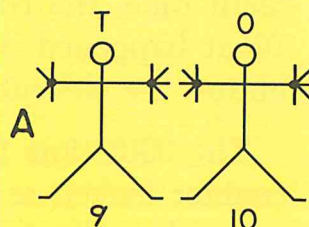
Susan has put pegs onto tens and ones counting men to record a count of 9 tens and 9 ones, or 99. Each peg on the ones man shows a count of 1. Each peg on the tens man shows a count of 1 ten and means that *all* the fingers on the ones man have been used 1 time. The pictures in A, B, and C help you see what else Susan did.

How many ones and how many tens do you see in A? In B?

Ten pegs are never left on a counting man because he would not be ready for another count.

In C, a third counting man is shown at the left of the tens man. A peg on him shows that all the fingers on the tens man have been used 1 time. The H above him stands for **hundreds**, which is a name for ten tens.

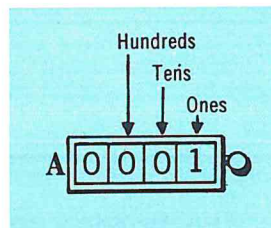
In C, Susan has recorded a count of 1 hundred, 0 tens, and 0 ones, or 100. Does $99 + 1 = 100$?



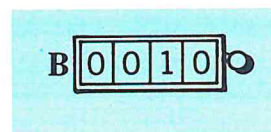
Tens and Hundreds

Dick showed the class how to use a tally counter. He turned the knob at the side to show four zeros.

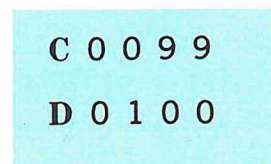
He said, "One," and pressed the button once. 1 appeared in the ones place of the counter as in A. Dick said, "Two," and pressed the button a second time. 2 took the place of 1 in the ones place. What happened when he pressed the button the third time? The fourth time? The ninth time? Only one-digit numbers show in each place on the tally counter.



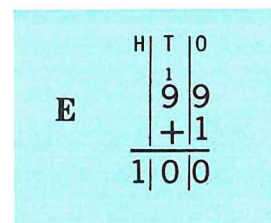
When Dick pushed the button the tenth time, the counter looked as in B. What happened when Dick pushed the button the eleventh time?



The 99th time that Dick pressed the button, the tally counter looked as in C. When Dick pressed the button again the tally counter looked as in D. What digit is now in the hundreds place? The tens place? The ones place? What do you think will happen in the ones place when he pushes the button again?



Look at the addition of 99 and 1 in E. What changes in form were made when ones were added? When tens were added? Is 1 hundred equal in value to 10 tens? Are 10 tens equal in value to 1 hundred, or 100?



Reading and Writing Three-Digit Numerals

Numerals that have places for hundreds, tens, and ones are called three-digit numerals. The numerals in the chart at the right are all three-digit numerals.

The numeral 101 means 1 hundred, 0 tens, and 1 one. It is read: One hundred one.

The numeral 675 means 6 hundreds, 7 tens, and 5 ones. How do you think it is read?

Oral Be ready to read each of the numerals that are shown at the right. Think how many hundreds, tens, and ones each means.

See below.

Written Make a grid using H for hundreds, T for tens, and O for ones. On it write the numerals for the following number words.

Hundreds	Tens	Ones
↓	↓	↓
1	0	1
6	7	5
1	0	2
1	0	3
1	2	3
5	6	7
4	0	0
8	9	0
9	4	9
7	5	6

H	T	O				H	T	O
6	4	3	1.	six hundred forty-three	eight hundred thirty-six	8	3	6
3	1	3	2.	three hundred thirteen	four hundred seventy-five	4	7	5
1	9	1	3.	one hundred ninety-one	seven hundred sixty	7	6	0
3	0	7	4.	three hundred seven	five hundred twenty-eight	5	2	8
9	8	0	5.	nine hundred eighty	two hundred fifty-four	2	5	4
4	0	2	6.	four hundred two	eight hundred	8	0	0
6	0	6	7.	six hundred six	five hundred fifteen	5	1	5

Can you do this? What is the largest number you can name by using each of the digits 1, 3, and 4 only once?

431

One hundred one; six hundred seventy-five; one hundred two; one hundred three; one hundred twenty-three; five hundred sixty-seven; four hundred; eight hundred ninety; nine hundred forty-nine; seven hundred fifty-six



How Much Is a Dollar?

Perry wished to buy a rocket kit that cost one dollar. He could pay for his kit using any of the sets of coins above.

Oral Use the picture above. Answer these questions.

1. How many half dollars are equal in value to 1 dollar? **2**
2. How many quarters are equal in value to 1 dollar? **4**
3. How many dimes are equal in value to 1 dollar? **10**

Written Write the answers to the questions below. Use the chart to help you.

1. How many nickels are equal in value to one dime? **2**
2. How many nickels are equal in value to one quarter? **5**
3. One dollar is equal in value to how many cents? **100**

COINS	CENTS	NICKELS	DIMES	QUARTERS	HALF DOLLARS
Nickel	5				
Dime	10	2			
Quarter	25	5			
Half Dollar	50	10	5	2	
Dollar	100	20	10	4	2

Counting Change

Mr. James runs the store across from the school. Jim bought a notebook from Mr. James. It cost 18¢. Jim gave Mr. James a quarter.

Mr. James counted the change this way: He repeated the price of the notebook first, saying, "Eighteen." Then he gave Jim a penny and said, "And 1 is nineteen." Then he gave him another penny and said, "And 1 more is twenty." Then he gave Jim a nickel and said, "And five is twenty-five."

Point to the correct coins at the right as you count the change for Mr. James.



Oral In each problem, tell what coins Mr. James would give as change and how he would count it. Begin with the price of the item. (Use the fewest coins possible.)

Coins and total change only.

1. Ann bought a pencil for 5¢. She gave Mr. James a dime. What would Mr. James do and say? *1 nickel; 5¢*
2. Pete bought a 39¢ book. He gave Mr. James a half dollar. What would Mr. James do and say? *1 penny, 1 dime; 11¢*
3. Sharon used a dollar to pay for a 79¢ book. How would you count her change? *1 penny, 2 dimes; 21¢*
4. May bought an 89¢ pen. Mr. James said, "Eighty-nine, ninety, one dollar." What change did May get? *1 penny, 1 dime; 11¢*

Written For each story problem above, decide how many pennies, nickels, or dimes each person received in change. Then write the amount he received. *See above.*



Reading Prices

Karen saw a doll in the toy shop window. The price was \$3.98. The 3 tells how many dollars. The 98 tells how many cents. The sign \$ is called a dollar sign. The period or point (.), is used in numerals

that stand for money to separate the dollars from the cents. The digits on the left of the point stand for dollars. The digits on the right stand for cents.

The price \$3.98 is read: "Three dollars and ninety-eight cents." The price \$3.00 is read: "Three dollars." The price \$3.05 is read: "Three dollars and five cents." The 0 is needed to tell you that the 5 means 5 cents and not 50 cents.

Oral Be ready to read the following prices.

<i>a</i>	<i>b</i>	<i>c</i>	<i>d</i>	<i>e</i>
1. \$2.95	\$4.16	\$3.08	\$7.12	\$6.00
2. \$1.19	\$2.90	\$4.85	\$5.05	\$3.02

Written Write each price, using numerals and signs.

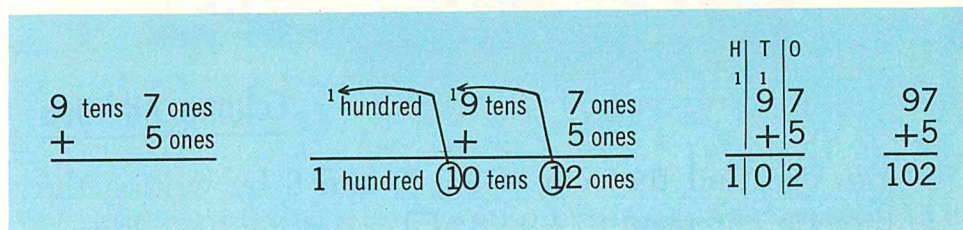
<i>a</i>	<i>b</i>
1. nine dollars \$9.00	three dollars and twenty cents \$3.20
2. six dollars \$6.00	five dollars and sixty-two cents \$5.62
3. eight dollars \$8.00	seven dollars and eight cents \$7.08

Can you do this? You know that 100 cents are equal in value to one dollar. How many cents are equal in value to \$4.00? \$2.75? \$7.04? \$9.90? \$5.00?

400 275 704 990 500

Changing the Form of Ones and Tens

The picture below shows how you can add 5 to 97. Study the picture carefully and then follow the steps below the picture.



Ones: 7 ones + 5 ones = 12 ones. Change the form of 12 ones to 1 ten and 2 ones. Write 2 in the ones place in the sum. Remember the 1 ten.

Tens: 1 ten remembered + 9 tens = 10 tens. Change the form of 10 tens to 1 hundred. There are no tens left. Write 0 in the tens place and 1 in the hundreds place. The sum of $97 + 5$ is 102.

Oral Read. Be ready to tell how to find each sum.

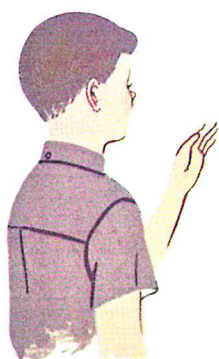
See preceding paragraphs.

	a	b	c	d	e	f	g
1.	$\begin{array}{r} 98 \\ +5 \\ \hline 103 \end{array}$	$\begin{array}{r} 92 \\ +9 \\ \hline 101 \end{array}$	$\begin{array}{r} 97 \\ +6 \\ \hline 103 \end{array}$	$\begin{array}{r} 93 \\ +8 \\ \hline 101 \end{array}$	$\begin{array}{r} 94 \\ +7 \\ \hline 101 \end{array}$	$\begin{array}{r} 95 \\ +6 \\ \hline 101 \end{array}$	$\begin{array}{r} 97 \\ +7 \\ \hline 104 \end{array}$
2.	$\begin{array}{r} 93 \\ +9 \\ \hline 102 \end{array}$	$\begin{array}{r} 96 \\ +8 \\ \hline 104 \end{array}$	$\begin{array}{r} 91 \\ +9 \\ \hline 100 \end{array}$	$\begin{array}{r} 92 \\ +8 \\ \hline 100 \end{array}$	$\begin{array}{r} 99 \\ +1 \\ \hline 100 \end{array}$	$\begin{array}{r} 98 \\ +2 \\ \hline 100 \end{array}$	$\begin{array}{r} 97 \\ +3 \\ \hline 100 \end{array}$
3.	$\begin{array}{r} 98 \\ +7 \\ \hline 105 \end{array}$	$\begin{array}{r} 99 \\ +2 \\ \hline 101 \end{array}$	$\begin{array}{r} 98 \\ +6 \\ \hline 104 \end{array}$	$\begin{array}{r} 94 \\ +9 \\ \hline 103 \end{array}$	$\begin{array}{r} 99 \\ +4 \\ \hline 103 \end{array}$	$\begin{array}{r} 98 \\ +8 \\ \hline 106 \end{array}$	$\begin{array}{r} 93 \\ +7 \\ \hline 100 \end{array}$
4.	$\begin{array}{r} 96 \\ +5 \\ \hline 101 \end{array}$	$\begin{array}{r} 94 \\ +8 \\ \hline 102 \end{array}$	$\begin{array}{r} 99 \\ +7 \\ \hline 106 \end{array}$	$\begin{array}{r} 95 \\ +8 \\ \hline 103 \end{array}$	$\begin{array}{r} 96 \\ +9 \\ \hline 105 \end{array}$	$\begin{array}{r} 97 \\ +5 \\ \hline 102 \end{array}$	$\begin{array}{r} 98 \\ +4 \\ \hline 102 \end{array}$

Written Copy rows 1 through 4. Write each sum.

See above.

MORE PRACTICE
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Column Addition

You can find the sum of 87, 9, and 8 by writing the arithmetic statement $87 + 9 + 8 = \square$ or writing the addition in column form as at the right. Then add as follows:

Ones: 7 ones + 9 ones = 16 ones.
16 ones + 8 ones = 24 ones.
Change the form of 24 ones to 2 tens and 4 ones. Write 4 in the ones place. Remember 2 tens.

Hundreds	Tens	Ones
↓	↓	↓
8	7	9
	+	8
1	0	4

Tens: 2 tens remembered + 8 tens = 10 tens. Change the form of 10 tens to 1 hundred and 0 tens. Write 0 in the tens place and 1 in the hundreds place. The sum is 104.

Oral Read. Be ready to tell each sum.

	<i>a</i>	<i>b</i>	<i>c</i>	<i>d</i>	<i>e</i>	<i>f</i>	<i>g</i>
1.	89 7 <u>+9</u> 105	88 9 <u>+9</u> 106	95 8 <u>+9</u> 112	96 8 <u>+9</u> 113	88 8 <u>+9</u> 105	96 5 <u>+6</u> 107	90 8 <u>+7</u> 105
2.	97 7 <u>+7</u> 111	7 97 <u>+8</u> 112	87 9 <u>+9</u> 105	9 8 <u>+86</u> 103	99 9 <u>+7</u> 115	6 86 <u>+8</u> 100	98 9 <u>+8</u> 115

MORE PRACTICE
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Written Copy rows 1 and 2. Write each sum. Check.
See above.

Using Money

Carol bought a bag of flour for 97¢ and a box of salt for 8¢. How much did she pay for both?

To solve the problem, you must think of the two amounts of money as being together, so you add the numbers. Perhaps you can think of the answer directly, for you know that $97¢ + 3¢ = 1$ dollar. You know that 1 dollar + 5 cents = 1 dollar and 5 cents. You can write the numerals as shown in A. Then add as shown in B.

$$\begin{array}{r} \text{A} \quad \$.97 \\ + .08 \\ \hline \end{array}$$

Think: First add the numbers that stand for cents: $8 + 7 = 15$. Think of the 15 cents as 1 dime and 5 cents. Write 5 in the cents place.

$$\begin{array}{r} \text{B} \quad \begin{array}{c} \text{Dollars} \\ \downarrow \\ \$.97 \\ + .08 \\ \hline \$1.05 \end{array} \end{array}$$

Then add the numbers that stand for dimes: 1 remembered + 9 = 10. Think of the 10 dimes as 1 dollar. There are no dimes left. Write 0 in the dimes place and 1 in the dollars place.

The sum stands for 1 dollar, 0 dimes, and 5 cents. This is written \$1.05. Carol paid \$1.05 altogether.

Written Copy. Write each sum. Check.

	<i>a</i>	<i>b</i>	<i>c</i>	<i>d</i>	<i>e</i>	<i>f</i>	<i>g</i>
1.	\$\$.99	\$.97	\$.93	\$.95	\$.91	\$.96	\$.97
	+.05	+.09	+.07	+.08	+.09	+.05	+.04
	<u>\$1.04</u>	<u>\$1.06</u>	<u>\$1.00</u>	<u>\$1.03</u>	<u>\$1.00</u>	<u>\$1.01</u>	<u>\$1.01</u>
2.	\$.09	\$.98	\$.03	\$.89	\$.07	\$.09	\$.06
	+.09	+.05	+.09	+.07	+.06	+.88	+.89
	<u>\$.18</u>	<u>\$1.03</u>	<u>\$.12</u>	<u>\$.96</u>	<u>\$.13</u>	<u>\$.97</u>	<u>\$.95</u>

Using Money in Story Problems

In each of these story problems, the numbers of the sets stand for money. Read each problem carefully, paying special attention to the problem question.

Oral Tell how you would solve each problem below. Tell how you decided. *In all problems below we wish to to combine sets, therefore we use addition.*

1. Jean bought fish for 97¢ and a bag of popcorn for 5¢. How much did she pay for both? $97+5=\square$ \$1.02
2. A package of cheese cost 93¢ last week. This week it costs 7¢ more. How much is the cheese now? $93+7=\square$ \$1.00
3. Walter bought meat for 94¢ and three candy balls for 9¢. How much did he spend? $94+9=\square$ \$1.03
4. Harvey bought a bag of potatoes for 94¢ and a package of gum for 6¢. How much did he pay? $94+6=\square$ \$1.00
5. Paul bought a bag of flour for 93¢ and a cake of soap for 9¢. How much did he pay in all? $93+9=\square$ \$1.02
6. Alice bought three squares of candy for 9¢ and a bag of sugar for 99¢. How much money did she spend? $99+9=\square$ \$1.08

Written Solve problems 1 through 6 above. *See above.*

Another way Use a short way to find the answer to such statements as $97+4=\square$. *Think:* $97+4=97+(3+1)=(97+3)+1=100+1=101$. Tell a short way to find the sum in each of these statements. Then tell the sum.

- | <i>a</i> | <i>b</i> | <i>c</i> | <i>d</i> |
|----------------------------------|-------------------------------|-------------------------------|-------------------------------|
| 1. $92+9=\square$ ¹⁰¹ | $96+5=\square$ ¹⁰¹ | $99+4=\square$ ¹⁰³ | $96+8=\square$ ¹⁰⁴ |
| 2. $97+4=\square$ ¹⁰¹ | $92+8=\square$ ¹⁰⁰ | $97+7=\square$ ¹⁰⁴ | $94+8=\square$ ¹⁰² |

Adding Two-Digit Numbers

Sometimes you will need to find the sum when both addends are two-digit numbers. You add the ones and then the tens as at the right.

Ones: 4 ones + 5 ones = 9 ones.
Write 9 in the ones place.

$$\begin{array}{r} 84 \\ +45 \\ \hline \end{array} \quad \begin{array}{r|l} \text{H} & \text{T} & \text{O} \\ \hline & 8 & 4 \\ + & 4 & 5 \\ \hline & 12 & 9 \end{array}$$

Tens: 8 tens + 4 tens = 12 tens.
Change the form of 12 tens to 1 hundred and 2 tens. Write 2 in the tens place and 1 in the hundreds place. The sum is 129.

In the addition shown below, ones must be changed in form to tens and tens to hundreds. Add as follows:

Ones: 7 ones + 8 ones = 15 ones.
Think of 15 ones as 1 ten and 5 ones.

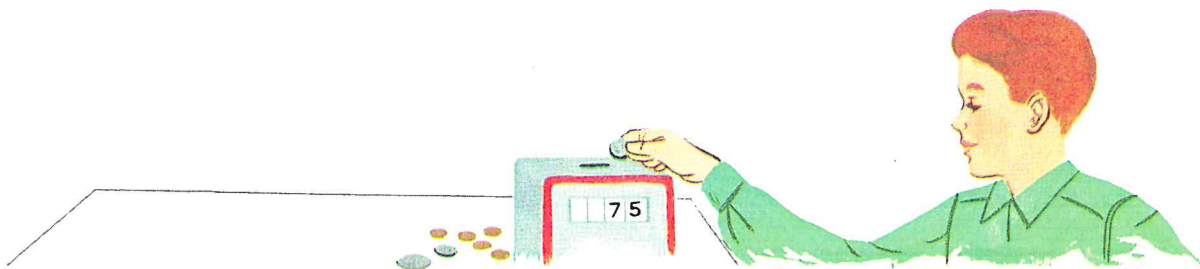
Tens: 1 ten remembered + 6 tens + 5 tens = 12 tens. Think of the 12 tens as 1 hundred and 2 tens. Write the sum as 125.

$$\begin{array}{r} 67 \\ +58 \\ \hline \end{array} \quad \begin{array}{r|l} \text{H} & \text{T} & \text{O} \\ \hline & 6 & 7 \\ + & 5 & 8 \\ \hline & 12 & 5 \end{array}$$

Oral Read row 1. Be ready to tell each sum.

	<i>a</i>	<i>b</i>	<i>c</i>	<i>d</i>	<i>e</i>	<i>f</i>	<i>g</i>
1.	$\begin{array}{r} 43 \\ +72 \\ \hline 115 \end{array}$	$\begin{array}{r} 80 \\ +60 \\ \hline 140 \end{array}$	$\begin{array}{r} 90 \\ +55 \\ \hline 145 \end{array}$	$\begin{array}{r} 87 \\ +40 \\ \hline 127 \end{array}$	$\begin{array}{r} 97 \\ +92 \\ \hline 189 \end{array}$	$\begin{array}{r} 56 \\ +53 \\ \hline 109 \end{array}$	$\begin{array}{r} 53 \\ +42 \\ \hline 95 \end{array}$
2.	$\begin{array}{r} 67 \\ +72 \\ \hline 139 \end{array}$	$\begin{array}{r} 39 \\ +70 \\ \hline 109 \end{array}$	$\begin{array}{r} 67 \\ +82 \\ \hline 149 \end{array}$	$\begin{array}{r} 73 \\ +74 \\ \hline 147 \end{array}$	$\begin{array}{r} 84 \\ +71 \\ \hline 155 \end{array}$	$\begin{array}{r} 78 \\ +91 \\ \hline 169 \end{array}$	$\begin{array}{r} 60 \\ +90 \\ \hline 150 \end{array}$
3.	$\begin{array}{r} 72 \\ +46 \\ \hline 118 \end{array}$	$\begin{array}{r} 57 \\ +53 \\ \hline 110 \end{array}$	$\begin{array}{r} 82 \\ +69 \\ \hline 151 \end{array}$	$\begin{array}{r} 99 \\ +23 \\ \hline 122 \end{array}$	$\begin{array}{r} 73 \\ +79 \\ \hline 152 \end{array}$	$\begin{array}{r} 73 \\ +88 \\ \hline 161 \end{array}$	$\begin{array}{r} 54 \\ +98 \\ \hline 152 \end{array}$

Written Copy rows 1 through 3. Write each sum.
See above.



Using Addition and Subtraction in Solving Problems

Before you can decide whether to add or to subtract to solve a problem, you should think about the story and the question.

<u>If the question means:</u>	<u>Then you are to:</u>
how many there are altogether	join the sets, or add the numbers of the sets.
how many are left	separate a set into parts, or subtract the numbers of the sets.
how many are gone	
how many more	compare the sets to find by how many they differ, or subtract the numbers of the sets.
how many fewer	
how many more are needed	

Oral Tell whether you should add or subtract to solve each of these problems. Tell why you decided as you did.

See T155 for additional answers.

- Tom weighs 46 pounds. Jack weighs 52 pounds. How much more does Jack weigh than Tom? **Subtract;**
 $52 - 46 = \square$ 6 pounds
- Edward had 75¢. He was paid 45¢ for work at home. How much money did he have then? **Add;** $75 + 45 = \square$
\$1.20
- Joan wants to buy a book that costs 32¢. She has 24¢. How much more money does she need? **Subtract;**
 $32 - 24 = \square$ 8¢

4. Elsie bought some paper for 17ϕ , a pencil for 5ϕ , and a pen for 7ϕ . How much did all three cost? **Add;**
 $17+5+7=\square$ 29ϕ
5. Mary went shopping with her mother. She had 93ϕ . When she got home she had 38ϕ . How much did she spend? **Subtract;** $93-38=\square$ 55ϕ
6. At the Burwood School, there were 73 pupils attending fourth grade and 79 pupils attending third grade. How many pupils were in the third and fourth grades together? **Add;** $73+79=\square$ 152 pupils
7. A girl brought 54 cupcakes to a party. A boy brought 98 cupcakes. How many more cupcakes were brought by the boy than by the girl? **Subtract;** $98-54=\square$
 44 cupcakes
8. Mavis brought 99 pears and 99 apples from her father's farm. How many pieces of fruit did she bring altogether? **Add;** $99+99=\square$ 198 pieces of fruit

Written Solve problems 1 through 8. **See above.**

Can you do this? Jane was the storekeeper at the school store. Write three problems she might have had to solve.

A quick review

	<i>a</i>	<i>b</i>	<i>c</i>	<i>d</i>	<i>e</i>	<i>f</i>	<i>g</i>
1.	$\begin{array}{r} 4 \\ +3 \\ \hline 7 \end{array}$	$\begin{array}{r} 15 \\ -6 \\ \hline 9 \end{array}$	$\begin{array}{r} 38 \\ -6 \\ \hline 32 \end{array}$	$\begin{array}{r} 72 \\ -9 \\ \hline 63 \end{array}$	$\begin{array}{r} 8 \\ +5 \\ \hline 13 \end{array}$	$\begin{array}{r} 6 \\ -3 \\ \hline 3 \end{array}$	$\begin{array}{r} 16 \\ +2 \\ \hline 18 \end{array}$
2.	$\begin{array}{r} 8 \\ 3 \\ +7 \\ \hline 18 \end{array}$	$\begin{array}{r} 44 \\ 9 \\ +6 \\ \hline 59 \end{array}$	$\begin{array}{r} 10 \\ 20 \\ +10 \\ \hline 40 \end{array}$	$\begin{array}{r} 33 \\ 22 \\ +27 \\ \hline 82 \end{array}$	$\begin{array}{r} 6 \\ 4 \\ +3 \\ \hline 13 \end{array}$	$\begin{array}{r} 23 \\ 3 \\ +4 \\ \hline 30 \end{array}$	$\begin{array}{r} 25 \\ 4 \\ +9 \\ \hline 38 \end{array}$
3.	$\begin{array}{r} 56 \\ +27 \\ \hline 83 \end{array}$	$\begin{array}{r} 27 \\ -8 \\ \hline 19 \end{array}$	$\begin{array}{r} 21 \\ +35 \\ \hline 56 \end{array}$	$\begin{array}{r} 63 \\ -58 \\ \hline 5 \end{array}$	$\begin{array}{r} 38 \\ +26 \\ \hline 64 \end{array}$	$\begin{array}{r} 57 \\ -24 \\ \hline 33 \end{array}$	$\begin{array}{r} 73 \\ -46 \\ \hline 27 \end{array}$

$$\begin{array}{c}
 \text{A} \\
 (50 + 6) + (50 + 8) + (50 + 5) = \text{B} \\
 (50 + 50 + 50) + (6 + 8 + 5) = \\
 \text{C} \\
 150 + 19, \text{ or } 169
 \end{array}$$

Column Addition with Two-Digit Numbers

Can you add 56, 58, and 55 as shown above? In **A** the () show how you can think of each number. In **B** you can see another way of arranging the addends. The sum of 56, 58, and 55 is shown in **C**.

The addition $56 + 58 + 55$ can be done on a grid as shown. Add as follows:

Ones: 6 ones + 8 ones = 14 ones. 14 ones + 5 ones = 19 ones, or 1 ten + 9 ones. Write 9 in the ones place.

Tens: 1 ten remembered + 5 tens = 6 tens. 6 tens + 5 tens = 11 tens. 11 tens + 5 tens = 16 tens, or 1 hundred and 6 tens. Write 1 in the hundreds place and 6 in the tens place. The sum is 1 hundred, 6 tens, and 9 ones, or 169.

H	T	O	
	5	6	56
	5	8	58
	+	5	55
1	6	9	169

Written Copy. Write each sum. Check.

	<i>a</i>	<i>b</i>	<i>c</i>	<i>d</i>	<i>e</i>	<i>f</i>	<i>g</i>
1.	97 89 +85 <hr/> 271	46 78 +42 <hr/> 166	76 82 +68 <hr/> 226	88 70 +65 <hr/> 223	90 86 +62 <hr/> 238	56 47 +50 <hr/> 153	99 87 +98 <hr/> 284
2.	88 79 +62 <hr/> 229	90 13 +47 <hr/> 150	86 27 +65 <hr/> 178	89 39 +48 <hr/> 176	89 52 +83 <hr/> 224	56 86 +75 <hr/> 217	64 37 +28 <hr/> 129
3.	48 56 +70 <hr/> 174	75 62 +88 <hr/> 225	40 76 +24 <hr/> 140	48 90 +62 <hr/> 200	52 39 +99 <hr/> 190	75 62 +89 <hr/> 226	75 50 +59 <hr/> 184

Reviewing Addition and Subtraction

You know that you can add or subtract numbers that stand for money in the same way you can add or subtract ones and tens. Some of the additions and subtractions on this page will help you practice using numbers that stand for money.

Oral Read. Be ready to give each sum or difference.

<i>a</i>	<i>b</i>	<i>c</i>	<i>d</i>	<i>e</i>	<i>f</i>	<i>g</i>
$\begin{array}{r} 78 \\ -36 \\ \hline 42 \end{array}$	$\begin{array}{r} 57 \\ -25 \\ \hline 32 \end{array}$	$\begin{array}{r} 87 \\ -67 \\ \hline 20 \end{array}$	$\begin{array}{r} 48 \\ -32 \\ \hline 16 \end{array}$	$\begin{array}{r} \$0.06 \\ +.09 \\ \hline \$.15 \end{array}$	$\begin{array}{r} \$0.09 \\ -0.08 \\ \hline \$.01 \end{array}$	$\begin{array}{r} \$0.05 \\ +.08 \\ \hline \$.13 \end{array}$

Written Copy. Write each sum or difference. Check.

	<i>a</i>	<i>b</i>	<i>c</i>	<i>d</i>	<i>e</i>	<i>f</i>	<i>g</i>
1.	$\begin{array}{r} 65 \\ +27 \\ \hline 92 \end{array}$	$\begin{array}{r} 72 \\ +25 \\ \hline 97 \end{array}$	$\begin{array}{r} 83 \\ -51 \\ \hline 32 \end{array}$	$\begin{array}{r} 26 \\ +43 \\ \hline 69 \end{array}$	$\begin{array}{r} 97 \\ +46 \\ \hline 143 \end{array}$	$\begin{array}{r} 21 \\ +43 \\ \hline 64 \end{array}$	$\begin{array}{r} \$59 \\ +.04 \\ \hline \$.63 \end{array}$
2.	$\begin{array}{r} 79 \\ -6 \\ \hline 73 \end{array}$	$\begin{array}{r} 56 \\ -4 \\ \hline 52 \end{array}$	$\begin{array}{r} 70 \\ -9 \\ \hline 61 \end{array}$	$\begin{array}{r} 40 \\ +98 \\ \hline 138 \end{array}$	$\begin{array}{r} 50 \\ +18 \\ \hline 68 \end{array}$	$\begin{array}{r} 20 \\ +93 \\ \hline 113 \end{array}$	$\begin{array}{r} \$06 \\ +.02 \\ \hline \$.08 \end{array}$
3.	$\begin{array}{r} 36 \\ +42 \\ \hline 78 \end{array}$	$\begin{array}{r} 37 \\ -7 \\ \hline 30 \end{array}$	$\begin{array}{r} 26 \\ +10 \\ \hline 36 \end{array}$	$\begin{array}{r} 52 \\ -21 \\ \hline 31 \end{array}$	$\begin{array}{r} 46 \\ +32 \\ \hline 78 \end{array}$	$\begin{array}{r} 50 \\ +76 \\ \hline 126 \end{array}$	$\begin{array}{r} \$30 \\ +.30 \\ \hline \$.60 \end{array}$
4.	$\begin{array}{r} \$01 \\ .02 \\ +.01 \\ \hline \$.04 \end{array}$	$\begin{array}{r} \$04 \\ .09 \\ +.38 \\ \hline \$.51 \end{array}$	$\begin{array}{r} \$82 \\ .04 \\ +.01 \\ \hline \$.87 \end{array}$	$\begin{array}{r} \$06 \\ .09 \\ +.03 \\ \hline \$.18 \end{array}$	$\begin{array}{r} \$03 \\ .01 \\ +.01 \\ \hline \$.05 \end{array}$	$\begin{array}{r} \$04 \\ .08 \\ +.06 \\ \hline \$.18 \end{array}$	$\begin{array}{r} \$14 \\ .09 \\ +.05 \\ \hline \$.28 \end{array}$
5.	$\begin{array}{r} 17 \\ 26 \\ +22 \\ \hline 65 \end{array}$	$\begin{array}{r} 57 \\ 62 \\ +30 \\ \hline 149 \end{array}$	$\begin{array}{r} 75 \\ 47 \\ +12 \\ \hline 134 \end{array}$	$\begin{array}{r} 5 \\ 97 \\ +70 \\ \hline 172 \end{array}$	$\begin{array}{r} 97 \\ 88 \\ +96 \\ \hline 281 \end{array}$	$\begin{array}{r} 73 \\ 27 \\ +58 \\ \hline 158 \end{array}$	$\begin{array}{r} 24 \\ 85 \\ +5 \\ \hline 114 \end{array}$
6.	$\begin{array}{r} 80 \\ 23 \\ +16 \\ \hline 119 \end{array}$	$\begin{array}{r} 27 \\ 66 \\ +45 \\ \hline 138 \end{array}$	$\begin{array}{r} 61 \\ 73 \\ +50 \\ \hline 184 \end{array}$	$\begin{array}{r} 75 \\ 87 \\ +54 \\ \hline 216 \end{array}$	$\begin{array}{r} 56 \\ 13 \\ +25 \\ \hline 94 \end{array}$	$\begin{array}{r} 50 \\ 10 \\ +20 \\ \hline 80 \end{array}$	$\begin{array}{r} \$46 \\ .78 \\ +.98 \\ \hline \$22.2 \end{array}$



Help in Problem Solving

The Brownie troop planned a dinner for their mothers. They made up some problems about the dinner.

In some of the problems you will need to join groups, or sets. Then you will add the numbers of the sets. In other problems you will need to take sets apart or compare sets to find by how many one set differs from another. Then you will subtract the numbers.

Oral Read each problem. Tell whether you should add or subtract to solve the problem. Tell how you decided. See T159 for additional answers.

1. The Brownie troop invited 16 mothers. There were also 16 Brownies and 2 leaders at the dinner. How many people altogether were to be at the dinner?
Add; $16+16+2=\square$ 34 people
2. Of the guests, 12 drank milk and 4 drank cocoa. How many more guests drank milk than cocoa? Subtract;
 $12-4=\square$ 8 guests
3. The girls bought crepe paper for \$.98, favors for \$.87, and nut cups for \$.75. How much did the crepe paper, favors, and nut cups cost altogether? Add; $98+87+75=\square$
\$2.60
4. Sally and Susan set places for 34 people. Sally set 16 of the places. How many places did Susan set?
Subtract; $34-16=\square$ 18 places
5. The girls made 16 party favors. 9 of them were pink. The rest were blue. How many were blue? Subtract;
 $16-9=\square$ 7 were blue



6. 14 Brownies helped with the dinner. 8 cooked the dinner and the rest served. How many did the serving?
 $14 - 8 = \square$ 6 did the serving

Written Solve problems 1 through 6.

Can you do this? Make up and write two more story problems about the Brownies' dinner.

A quick review

	<i>a</i>	<i>b</i>	<i>c</i>	<i>d</i>	<i>e</i>	<i>f</i>
1.	$\begin{array}{r} 18 \\ -9 \\ \hline 9 \end{array}$	$\begin{array}{r} 14 \\ -9 \\ \hline 5 \end{array}$	$\begin{array}{r} 15 \\ -8 \\ \hline 7 \end{array}$	$\begin{array}{r} 13 \\ -7 \\ \hline 6 \end{array}$	$\begin{array}{r} 17 \\ -8 \\ \hline 9 \end{array}$	$\begin{array}{r} 13 \\ -8 \\ \hline 5 \end{array}$
2.	$\begin{array}{r} 16 \\ -9 \\ \hline 7 \end{array}$	$\begin{array}{r} 12 \\ -7 \\ \hline 5 \end{array}$	$\begin{array}{r} 13 \\ -6 \\ \hline 7 \end{array}$	$\begin{array}{r} 16 \\ -7 \\ \hline 9 \end{array}$	$\begin{array}{r} 13 \\ -5 \\ \hline 8 \end{array}$	$\begin{array}{r} 14 \\ -6 \\ \hline 8 \end{array}$
3.	$\begin{array}{r} 14 \\ -8 \\ \hline 6 \end{array}$	$\begin{array}{r} 15 \\ -7 \\ \hline 8 \end{array}$	$\begin{array}{r} 16 \\ -8 \\ \hline 8 \end{array}$	$\begin{array}{r} 14 \\ -7 \\ \hline 7 \end{array}$	$\begin{array}{r} 12 \\ -6 \\ \hline 6 \end{array}$	$\begin{array}{r} 14 \\ -9 \\ \hline 5 \end{array}$
4.	$\begin{array}{r} 35 \\ +74 \\ \hline 109 \end{array}$	$\begin{array}{r} 86 \\ +45 \\ \hline 131 \end{array}$	$\begin{array}{r} 21 \\ +75 \\ \hline 96 \end{array}$	$\begin{array}{r} 36 \\ +27 \\ \hline 63 \end{array}$	$\begin{array}{r} 51 \\ +23 \\ \hline 74 \end{array}$	$\begin{array}{r} 72 \\ +61 \\ \hline 133 \end{array}$
5.	$\begin{array}{r} 16 \\ +85 \\ \hline 101 \end{array}$	$\begin{array}{r} 65 \\ +57 \\ \hline 122 \end{array}$	$\begin{array}{r} 23 \\ +84 \\ \hline 107 \end{array}$	$\begin{array}{r} 16 \\ +38 \\ \hline 54 \end{array}$	$\begin{array}{r} 72 \\ +58 \\ \hline 130 \end{array}$	$\begin{array}{r} 86 \\ +43 \\ \hline 129 \end{array}$
6.	$\begin{array}{r} 91 \\ +64 \\ \hline 155 \end{array}$	$\begin{array}{r} 78 \\ +65 \\ \hline 143 \end{array}$	$\begin{array}{r} 63 \\ +95 \\ \hline 158 \end{array}$	$\begin{array}{r} 90 \\ +55 \\ \hline 145 \end{array}$	$\begin{array}{r} 25 \\ +50 \\ \hline 75 \end{array}$	$\begin{array}{r} 29 \\ +36 \\ \hline 65 \end{array}$
7.	$\begin{array}{r} \$0.60 \\ +.98 \\ \hline \$1.58 \end{array}$	$\begin{array}{r} \$0.99 \\ +.75 \\ \hline \$1.74 \end{array}$	$\begin{array}{r} \$0.88 \\ +.82 \\ \hline \$1.70 \end{array}$	$\begin{array}{r} \$0.90 \\ +.06 \\ \hline \$0.96 \end{array}$	$\begin{array}{r} \$0.79 \\ +.85 \\ \hline \$1.64 \end{array}$	$\begin{array}{r} \$0.11 \\ +.79 \\ \hline \$0.90 \end{array}$

Using Money in Story Problems

Read each problem carefully. At the right below find the prices of the things the problem tells about.

Oral Try solving each problem without using your pencils. Tell how you solved each problem.

1. Mary's mother asked her to buy a 10 pound bag of sugar and a package of paper cups. How much money did Mary need?

$$99+9=\square \quad \$1.08$$

2. Ellen's mother sent her to the store to buy a dozen eggs and 1 pound of coffee. How much money did Ellen need? $55+87=\square$

$$\$1.42$$

3. Philip bought 2 pounds of bananas for his mother. How much should Philip pay? $23+23=\square \quad 46¢$

4. Ann bought a dozen eggs, a half gallon of ice cream, and a package of paper cups. How much did Ann pay for these things? $55+89+9=\square \quad \$1.53$

5. Sam's mother needs 10 pounds of potatoes and 1 pound of bananas. How much money will these two items cost? $63+23=\square \quad 86¢$

6. Alice's mother gave her money for 10 pounds of sugar and a pound of coffee. How much money did Alice need for both? $99+87=\square \quad \$1.86$

Potatoes, 10 lb.	63¢
Bananas, lb.	23¢
Sugar, 10 lb.	99¢
Coffee, 1 lb. can	87¢
Eggs, doz.	55¢
Paper cups, pkg.	9¢
Ice cream, half gal.	89¢

Written Solve problems 1 through 6 above. See above.

Checkup Time

The numerals in () tell the pages where you can turn for help if you need it.

Important Ideas

1. One hundred is equal in value to 10 tens. (143, 144)

2. In a three-digit numeral, the digit farthest to the left stands for hundreds. (144, 145)

3. A dollar is equal in value to 100 cents. (146)

4. In numerals that stand for money, the digits to the left of the point indicate dollars. (148)

5. You can change the form of 10 tens to 1 hundred in the same way you change the form of 10 ones to 1 ten. (149)

Questions to Discuss

See T161 for answers.

1. What does the sign \$ stand for? (148)

2. What does the zero to the right of the point in \$.04 stand for? What does the 4 stand for? (148)

3. What steps would you take to add in A? (149)

4. What steps would you take to add in B? (151)

5. What steps would you take to add in C? (156)

6. What steps would you take to add in D? (157)

$$\begin{array}{r} \text{A} \quad 94 \\ +9 \\ \hline \end{array}$$

$$\begin{array}{r} \text{B} \quad \$.94 \\ + .09 \\ \hline \end{array}$$

$$\begin{array}{r} \text{C} \quad 76 \\ 57 \\ +64 \\ \hline \end{array}$$

$$\begin{array}{r} \text{D} \quad \$.76 \\ .57 \\ +.64 \\ \hline \end{array}$$

Written Practice

Copy. Write each sum. Check.
(153, 156, 157)

	<i>a</i>	<i>b</i>	<i>c</i>	<i>d</i>
1.	$\begin{array}{r} 76 \\ +52 \\ \hline 128 \end{array}$	$\begin{array}{r} \$.53 \\ + .75 \\ \hline \$ 1.28 \end{array}$	$\begin{array}{r} 65 \\ +87 \\ \hline 152 \end{array}$	$\begin{array}{r} \$.79 \\ +.62 \\ \hline \$ 1.41 \end{array}$
2.	$\begin{array}{r} 47 \\ 29 \\ +88 \\ \hline 164 \end{array}$	$\begin{array}{r} \$.56 \\ .38 \\ +.67 \\ \hline \$ 1.61 \end{array}$	$\begin{array}{r} 35 \\ 62 \\ +98 \\ \hline 195 \end{array}$	$\begin{array}{r} \$.48 \\ .62 \\ +.13 \\ \hline \$ 1.23 \end{array}$
3.	$\begin{array}{r} 35 \\ +21 \\ \hline 56 \end{array}$	$\begin{array}{r} \$.46 \\ +.23 \\ \hline \$.69 \end{array}$	$\begin{array}{r} 87 \\ +49 \\ \hline 136 \end{array}$	$\begin{array}{r} \$.63 \\ +.24 \\ \hline \$.87 \\ 161 \end{array}$

Self-Evaluation

Part 1 Copy. Write each sum or difference. Check.

	<i>a</i>	<i>b</i>	<i>c</i>	<i>d</i>
1.	$\begin{array}{r} 8 \\ +3 \\ \hline 11 \end{array}$	$\begin{array}{r} 7 \\ +6 \\ \hline 13 \end{array}$	$\begin{array}{r} 4 \\ +9 \\ \hline 13 \end{array}$	$\begin{array}{r} 4 \\ +7 \\ \hline 11 \end{array}$
2.	$\begin{array}{r} 8 \\ +7 \\ \hline 15 \end{array}$	$\begin{array}{r} 6 \\ +8 \\ \hline 14 \end{array}$	$\begin{array}{r} 7 \\ +6 \\ \hline 13 \end{array}$	$\begin{array}{r} 8 \\ +4 \\ \hline 12 \end{array}$
3.	$\begin{array}{r} 4\text{¢} \\ +3\text{¢} \\ \hline 7\text{¢} \end{array}$	$\begin{array}{r} 2\text{¢} \\ +7\text{¢} \\ \hline 9\text{¢} \end{array}$	$\begin{array}{r} 3\text{¢} \\ +6\text{¢} \\ \hline 9\text{¢} \end{array}$	$\begin{array}{r} 8\text{¢} \\ +1\text{¢} \\ \hline 9\text{¢} \end{array}$
4.	$\begin{array}{r} 33 \\ +7 \\ \hline 40 \end{array}$	$\begin{array}{r} \$.45 \\ +.06 \\ \hline \$.51 \end{array}$	$\begin{array}{r} 96 \\ +8 \\ \hline 104 \end{array}$	$\begin{array}{r} \$.98 \\ +.05 \\ \hline \$ 1.03 \end{array}$
5.	$\begin{array}{r} 27 \\ -3 \\ \hline 24 \end{array}$	$\begin{array}{r} \$.43 \\ -.02 \\ \hline \$.41 \end{array}$	$\begin{array}{r} 24 \\ -9 \\ \hline 15 \end{array}$	$\begin{array}{r} \$.53 \\ -.07 \\ \hline \$.46 \end{array}$
6.	$\begin{array}{r} 85 \\ 9 \\ +9 \\ \hline 103 \end{array}$	$\begin{array}{r} \$.79 \\ .08 \\ +.07 \\ \hline \$.94 \end{array}$	$\begin{array}{r} 32 \\ 57 \\ +79 \\ \hline 168 \end{array}$	$\begin{array}{r} \$.43 \\ .76 \\ +.48 \\ \hline \$ 1.67 \end{array}$
7.	$\begin{array}{r} 43 \\ -28 \\ \hline 15 \end{array}$	$\begin{array}{r} \$.32 \\ -.14 \\ \hline \$.18 \end{array}$	$\begin{array}{r} 33 \\ -27 \\ \hline 6 \end{array}$	$\begin{array}{r} \$.42 \\ -.36 \\ \hline \$.06 \end{array}$
8.	$\begin{array}{r} 56 \\ +55 \\ \hline 111 \end{array}$	$\begin{array}{r} \$.38 \\ +.74 \\ \hline \$ 1.12 \end{array}$	$\begin{array}{r} 97 \\ +43 \\ \hline 140 \end{array}$	$\begin{array}{r} \$.46 \\ +.88 \\ \hline \$ 1.34 \end{array}$
9.	$\begin{array}{r} 43 \\ 51 \\ +24 \\ \hline 118 \end{array}$	$\begin{array}{r} \$.38 \\ .56 \\ +.74 \\ \hline \$ 1.68 \end{array}$	$\begin{array}{r} 37 \\ 19 \\ +68 \\ \hline 124 \end{array}$	$\begin{array}{r} \$.43 \\ .24 \\ +.65 \\ \hline \$ 1.32 \end{array}$
10.	$\begin{array}{r} 57 \\ 36 \\ +84 \\ \hline 177 \end{array}$	$\begin{array}{r} \$.43 \\ .67 \\ +.28 \\ \hline \$ 1.38 \end{array}$	$\begin{array}{r} 15 \\ 29 \\ +84 \\ \hline 128 \end{array}$	$\begin{array}{r} \$.86 \\ .32 \\ +.65 \\ \hline \$ 1.83 \end{array}$

Part 2 Solve each problem.

1. Louis bought a notebook for \$.57 and a pad of paper for \$.18. How much more did the notebook cost than the paper?
 $57-18=\square$ \$.39

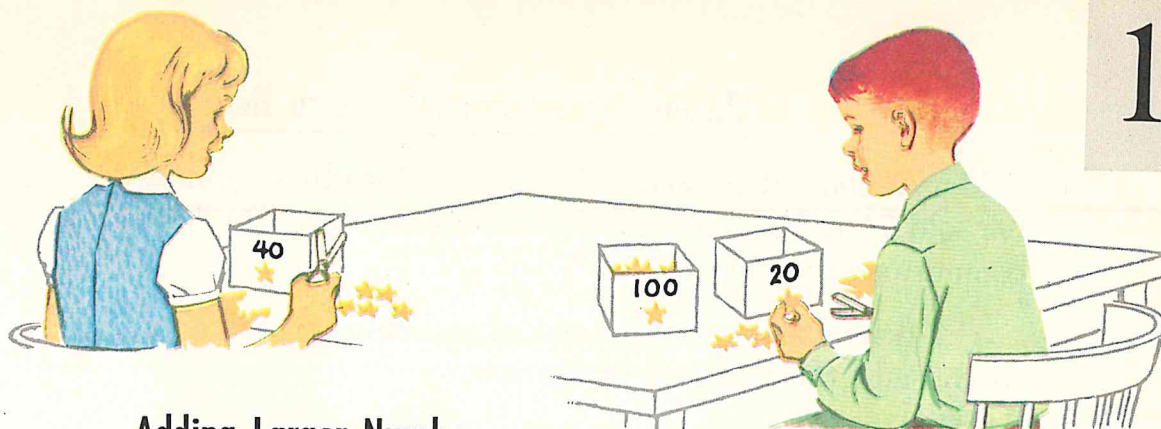
2. At the school bazaar, Sue's mother bought an apron for \$.98, a tea cozy for \$.25, and some candles for \$.46. How much did she spend altogether?
 $98+25+46=\square$ \$1.69

3. Sharon's weather record showed that the temperature was 45° at noon on Tuesday and 56° at noon on Wednesday. How much warmer was it on Wednesday than on Tuesday?
 $56-45=\square$ 11°

4. Billy's mother had 2 quarts of milk. How many cups of milk could she fill from 2 quarts?
 $4+4=\square$ 8 cups

5. Peter bought a coloring book for \$.26, a box of paints for \$.77, and a pencil for \$.05. How much money did Peter spend?
 $26+77+5=\square$ \$1.08

6. Tim picked 20 pints of blackberries, his brother picked 19, his mother picked 15, and his father picked 25. How many pints were picked in all?
 $20+19+15+25=\square$ 79 pints



Adding Larger Numbers

Look at Bill's stars. He has $100+20+4$, or 124 stars. Sally has $40+5$, or 45 stars. To find how many stars they have altogether, you add.

$\begin{array}{r} 124 \\ +45 \\ \hline \end{array}$	<table border="0"> <tr> <td>1 hundred</td> <td>2 tens</td> <td>4 ones</td> </tr> <tr> <td>+</td> <td>4 tens</td> <td>5 ones</td> </tr> <tr> <td>1 hundred</td> <td>6 tens</td> <td>9 ones</td> </tr> </table>	1 hundred	2 tens	4 ones	+	4 tens	5 ones	1 hundred	6 tens	9 ones	<table border="0"> <tr> <td>H</td> <td>T</td> <td>O</td> <td></td> </tr> <tr> <td>1</td> <td>2</td> <td>4</td> <td>124</td> </tr> <tr> <td>+</td> <td>4</td> <td>5</td> <td>+45</td> </tr> <tr> <td>1</td> <td>6</td> <td>9</td> <td>169</td> </tr> </table>	H	T	O		1	2	4	124	+	4	5	+45	1	6	9	169
1 hundred	2 tens	4 ones																									
+	4 tens	5 ones																									
1 hundred	6 tens	9 ones																									
H	T	O																									
1	2	4	124																								
+	4	5	+45																								
1	6	9	169																								

If you know how to add 45 to 24, you can probably add 45 to 124. Simply add the digits in the ones place, add the digits in the tens place, and write the digit in the hundreds place as part of the sum. The sum is 1 hundred, 6 tens, and 9 ones, or 169. The children have 169 stars altogether.

Oral Read. Tell the steps to take in finding the sum in each addition below. *See preceding paragraphs.*

<i>a</i>	<i>b</i>	<i>c</i>	<i>d</i>	<i>e</i>	<i>f</i>	<i>g</i>
$\begin{array}{r} 731 \\ +53 \\ \hline \end{array}$	$\begin{array}{r} 56 \\ +611 \\ \hline \end{array}$	$\begin{array}{r} 600 \\ +25 \\ \hline \end{array}$	$\begin{array}{r} 803 \\ +82 \\ \hline \end{array}$	$\begin{array}{r} 11 \\ +988 \\ \hline \end{array}$	$\begin{array}{r} 243 \\ +10 \\ \hline \end{array}$	$\begin{array}{r} 642 \\ +12 \\ \hline \end{array}$
784	667	625	885	999	253	654

Written Copy *a* through *g*. Write each sum. *See above.*

Changing the Form of Tens to Hundreds

Mary's committee sold 138 tickets. Dorothy's committee sold 71 tickets. How many tickets were sold by both committees together?

The tickets are to be thought of as being put together, so you add the numbers of the sets.

$\begin{array}{r} 138 \\ +71 \\ \hline \end{array}$		<table style="border-collapse: collapse;"> <tr> <td style="border-right: 1px solid black; padding: 0 5px;">H</td> <td style="border-right: 1px solid black; padding: 0 5px;">T</td> <td style="padding: 0 5px;">O</td> <td style="padding: 0 10px;"></td> <td></td> </tr> <tr> <td style="border-right: 1px solid black; padding: 0 5px; text-align: center;">1</td> <td style="border-right: 1px solid black; padding: 0 5px; text-align: center;">3</td> <td style="padding: 0 5px; text-align: center;">8</td> <td style="padding: 0 10px;"></td> <td style="text-align: right;">138</td> </tr> <tr> <td style="border-right: 1px solid black; padding: 0 5px; text-align: center;">+</td> <td style="border-right: 1px solid black; padding: 0 5px; text-align: center;">7</td> <td style="padding: 0 5px; text-align: center;">1</td> <td style="padding: 0 10px;"></td> <td style="text-align: right;">+71</td> </tr> <tr> <td style="border-right: 1px solid black; padding: 0 5px; text-align: center;">2</td> <td style="border-right: 1px solid black; padding: 0 5px; text-align: center;">0</td> <td style="padding: 0 5px; text-align: center;">9</td> <td style="padding: 0 10px;"></td> <td style="text-align: right;">209</td> </tr> </table>	H	T	O			1	3	8		138	+	7	1		+71	2	0	9		209
H	T	O																				
1	3	8		138																		
+	7	1		+71																		
2	0	9		209																		
	<table style="border-collapse: collapse;"> <tr> <td style="padding: 0 5px;">3 tens</td> <td style="padding: 0 10px;"></td> <td style="padding: 0 5px;">8 ones</td> </tr> <tr> <td style="padding: 0 5px;">7 tens</td> <td style="padding: 0 10px;"></td> <td style="padding: 0 5px;">1 one</td> </tr> <tr> <td style="padding: 0 5px;">2 hundreds</td> <td style="padding: 0 10px;"></td> <td style="padding: 0 5px;">9 ones</td> </tr> </table>	3 tens		8 ones	7 tens		1 one	2 hundreds		9 ones												
3 tens		8 ones																				
7 tens		1 one																				
2 hundreds		9 ones																				

If you know how to add 71 and 38, you can probably add 71 and 138. First, add in the ones place. $8+1=9$. Then add in the tens place. The sum of 7 tens and 3 tens is 10 tens. Change the form of the 10 tens to 1 hundred and add it to the hundreds. You add hundreds in the same way you add ones and tens. What is the sum?

Oral Tell how you would add 282 and 26. 45 and 362. 26 and 183. See preceding paragraph.

Written Copy. Write each sum. Check.

	<i>a</i>	<i>b</i>	<i>c</i>	<i>d</i>	<i>e</i>	<i>f</i>	<i>g</i>
1.	$\begin{array}{r} 41 \\ +160 \\ \hline 201 \end{array}$	$\begin{array}{r} 350 \\ +86 \\ \hline 436 \end{array}$	$\begin{array}{r} 192 \\ +81 \\ \hline 273 \end{array}$	$\begin{array}{r} 784 \\ +91 \\ \hline 875 \end{array}$	$\begin{array}{r} 451 \\ +93 \\ \hline 544 \end{array}$	$\begin{array}{r} 372 \\ +57 \\ \hline 429 \end{array}$	$\begin{array}{r} 63 \\ +151 \\ \hline 214 \end{array}$
2.	$\begin{array}{r} 95 \\ +794 \\ \hline 889 \end{array}$	$\begin{array}{r} 191 \\ +82 \\ \hline 273 \end{array}$	$\begin{array}{r} 747 \\ +70 \\ \hline 817 \end{array}$	$\begin{array}{r} 70 \\ +260 \\ \hline 330 \end{array}$	$\begin{array}{r} 883 \\ +81 \\ \hline 964 \end{array}$	$\begin{array}{r} 673 \\ +84 \\ \hline 757 \end{array}$	$\begin{array}{r} 57 \\ +362 \\ \hline 419 \end{array}$
3.	$\begin{array}{r} 678 \\ +51 \\ \hline 729 \end{array}$	$\begin{array}{r} 350 \\ +94 \\ \hline 444 \end{array}$	$\begin{array}{r} 475 \\ +60 \\ \hline 535 \end{array}$	$\begin{array}{r} 798 \\ +31 \\ \hline 829 \end{array}$	$\begin{array}{r} 429 \\ +80 \\ \hline 509 \end{array}$	$\begin{array}{r} 290 \\ +29 \\ \hline 319 \end{array}$	$\begin{array}{r} 181 \\ +67 \\ \hline 248 \end{array}$

Changing the Form of Ones to Tens

How would you add 27 to 145? Look at the picture below and see how it is done.

$\begin{array}{r} 145 \\ +27 \\ \hline \end{array}$	<table border="0"> <tr> <td>1 hundred</td> <td>4 tens</td> <td>5 ones</td> </tr> <tr> <td>+</td> <td>2 tens</td> <td>7 ones</td> </tr> <tr style="border-top: 1px solid black;"> <td>1 hundred</td> <td>7 tens</td> <td>12 ones</td> </tr> </table>	1 hundred	4 tens	5 ones	+	2 tens	7 ones	1 hundred	7 tens	12 ones	<table border="0"> <tr> <td>H</td> <td>T</td> <td>O</td> </tr> <tr> <td></td> <td>1</td> <td></td> </tr> <tr> <td>1</td> <td>4</td> <td>5</td> </tr> <tr> <td>+</td> <td>2</td> <td>7</td> </tr> <tr style="border-top: 1px solid black;"> <td>1</td> <td>7</td> <td>2</td> </tr> </table>	H	T	O		1		1	4	5	+	2	7	1	7	2	$\begin{array}{r} 145 \\ +27 \\ \hline 172 \end{array}$
1 hundred	4 tens	5 ones																									
+	2 tens	7 ones																									
1 hundred	7 tens	12 ones																									
H	T	O																									
	1																										
1	4	5																									
+	2	7																									
1	7	2																									

5 ones + 7 ones = 12 ones. The form of 12 ones must be changed to 1 ten and 2 ones. Why? What is done with the 2 ones? With the 1 ten? How does knowing how to add 45 and 27 help you add 145 and 27? How much are 145 and 27?

Oral Tell how you would add in each statement. See preceding paragraph.

a 260
 $236 + 24 = \square$

b 584
 $58 + 526 = \square$

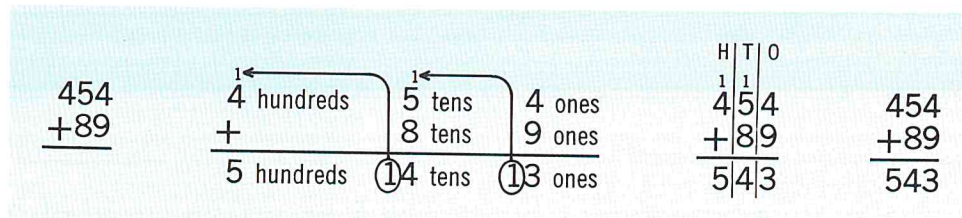
c 466
 $437 + 29 = \square$

Written Copy. Write each sum. Check.

	<i>a</i>	<i>b</i>	<i>c</i>	<i>d</i>	<i>e</i>	<i>f</i>	<i>g</i>
1.	$\begin{array}{r} 315 \\ +77 \\ \hline 392 \end{array}$	$\begin{array}{r} 465 \\ +28 \\ \hline 493 \end{array}$	$\begin{array}{r} 507 \\ +84 \\ \hline 591 \end{array}$	$\begin{array}{r} 416 \\ +74 \\ \hline 490 \end{array}$	$\begin{array}{r} 919 \\ +52 \\ \hline 971 \end{array}$	$\begin{array}{r} 328 \\ +44 \\ \hline 372 \end{array}$	$\begin{array}{r} 407 \\ +35 \\ \hline 442 \end{array}$
2.	$\begin{array}{r} 845 \\ +51 \\ \hline 896 \end{array}$	$\begin{array}{r} 732 \\ +59 \\ \hline 791 \end{array}$	$\begin{array}{r} 614 \\ +26 \\ \hline 640 \end{array}$	$\begin{array}{r} 953 \\ +27 \\ \hline 980 \end{array}$	$\begin{array}{r} 824 \\ +43 \\ \hline 867 \end{array}$	$\begin{array}{r} 820 \\ +40 \\ \hline 860 \end{array}$	$\begin{array}{r} 412 \\ +81 \\ \hline 493 \end{array}$
3.	$\begin{array}{r} 646 \\ +48 \\ \hline 694 \end{array}$	$\begin{array}{r} 238 \\ +60 \\ \hline 298 \end{array}$	$\begin{array}{r} 238 \\ +54 \\ \hline 292 \end{array}$	$\begin{array}{r} 705 \\ +87 \\ \hline 792 \end{array}$	$\begin{array}{r} 332 \\ +58 \\ \hline 390 \end{array}$	$\begin{array}{r} 431 \\ +68 \\ \hline 499 \end{array}$	$\begin{array}{r} 230 \\ +60 \\ \hline 290 \end{array}$
4.	$\begin{array}{r} 721 \\ +39 \\ \hline 760 \end{array}$	$\begin{array}{r} 832 \\ +28 \\ \hline 860 \end{array}$	$\begin{array}{r} 546 \\ +25 \\ \hline 571 \end{array}$	$\begin{array}{r} 708 \\ +74 \\ \hline 782 \end{array}$	$\begin{array}{r} 304 \\ +69 \\ \hline 373 \end{array}$	$\begin{array}{r} 828 \\ +38 \\ \hline 866 \end{array}$	$\begin{array}{r} 645 \\ +27 \\ \hline 672 \\ 165 \end{array}$

Changing the Form of Ones to Tens and Tens to Hundreds

If you know how to add 89 to 54, you also know how to add 89 to 454. Look at the picture below. Be ready to tell what was done with the ones, tens, and hundreds.



The sum of 454 and 89 is 5 hundreds, 4 tens, and 3 ones, or 543.

Oral Read. Be ready to tell how you would add in each of the following statements. Then tell the sum. *See tint block above.*

- | | | |
|---|---|---|
| $\overset{a}{\overset{620}{1. \quad 569 + 51 = \square}}$ | $\overset{b}{\overset{853}{2. \quad 85 + 768 = \square}}$ | $\overset{c}{\overset{430}{3. \quad 387 + 43 = \square}}$ |
| $\overset{454}{4. \quad 69 + 385 = \square}$ | $\overset{751}{5. \quad 57 + 694 = \square}$ | $\overset{822}{6. \quad 783 + 39 = \square}$ |

Written Copy. Write each sum. Check.

	a	b	c	d	e	f
1.	$\begin{array}{r} 158 \\ +25 \\ \hline 183 \end{array}$	$\begin{array}{r} 275 \\ +25 \\ \hline 300 \end{array}$	$\begin{array}{r} 698 \\ +85 \\ \hline 783 \end{array}$	$\begin{array}{r} 235 \\ +76 \\ \hline 311 \end{array}$	$\begin{array}{r} 195 \\ +15 \\ \hline 210 \end{array}$	$\begin{array}{r} 495 \\ +79 \\ \hline 574 \end{array}$
2.	$\begin{array}{r} 358 \\ +60 \\ \hline 418 \end{array}$	$\begin{array}{r} 300 \\ +25 \\ \hline 325 \end{array}$	$\begin{array}{r} 550 \\ +10 \\ \hline 560 \end{array}$	$\begin{array}{r} 500 \\ +98 \\ \hline 598 \end{array}$	$\begin{array}{r} 160 \\ +45 \\ \hline 205 \end{array}$	$\begin{array}{r} 325 \\ +57 \\ \hline 382 \end{array}$
3.	$\begin{array}{r} 46 \\ 25 \\ +114 \\ \hline 185 \end{array}$	$\begin{array}{r} 725 \\ 49 \\ +17 \\ \hline 791 \end{array}$	$\begin{array}{r} 208 \\ 38 \\ +24 \\ \hline 270 \end{array}$	$\begin{array}{r} 57 \\ 265 \\ +46 \\ \hline 368 \end{array}$	$\begin{array}{r} 286 \\ 79 \\ +98 \\ \hline 463 \end{array}$	$\begin{array}{r} 80 \\ 708 \\ +79 \\ \hline 867 \end{array}$

Adding Three-Digit Numbers

Larry wished to add 2 three-digit numbers, 535 and 324. He first wrote the arithmetic statement $535 + 324 = \square$. He could also have written the addition on a grid, or in column form as at the right.

<table style="border-collapse: collapse;"> <tr><td></td><td style="border-right: 1px solid black; padding: 0 5px;">H</td><td style="border-right: 1px solid black; padding: 0 5px;">T</td><td style="padding: 0 5px;">O</td></tr> <tr><td style="padding: 0 5px;">5</td><td style="border-right: 1px solid black; padding: 0 5px;">3</td><td style="border-right: 1px solid black; padding: 0 5px;">5</td><td style="padding: 0 5px;"></td></tr> <tr><td style="padding: 0 5px;">+3</td><td style="border-right: 1px solid black; padding: 0 5px;">2</td><td style="border-right: 1px solid black; padding: 0 5px;">4</td><td style="padding: 0 5px;"></td></tr> <tr><td style="border-top: 1px solid black; padding: 0 5px;">8</td><td style="border-right: 1px solid black; border-top: 1px solid black; padding: 0 5px;">5</td><td style="border-top: 1px solid black; padding: 0 5px;">9</td><td style="padding: 0 5px;"></td></tr> </table>		H	T	O	5	3	5		+3	2	4		8	5	9		<table style="border-collapse: collapse;"> <tr><td style="padding: 0 5px;">535</td></tr> <tr><td style="padding: 0 5px;">+324</td></tr> <tr><td style="border-top: 1px solid black; padding: 0 5px;">859</td></tr> </table>	535	+324	859
	H	T	O																	
5	3	5																		
+3	2	4																		
8	5	9																		
535																				
+324																				
859																				

Did Larry have to change the form of ones to tens in his addition? Did he have to change the form of tens to hundreds? Why was it not necessary to change the form of ones or tens?

Oral Be ready to tell how each of the following additions was done. The reminder numerals will help you see which changes in form were needed. See below.

A

	H	T	O
1	5	3	2
+3	9	4	
9	2	6	

B

	H	T	O
1	6	2	8
+2	4	5	
8	7	3	

C

	H	T	O
1	6	7	8
+1	9	7	
8	7	5	

D

	H	T	O
1	1	7	9
+3	7	5	
5	5	4	

Written Copy. Write each sum. Check. *Reminder:* In addition with 3 or more addends, you can add only 2 numbers at one time.

	<i>a</i>	<i>b</i>	<i>c</i>	<i>d</i>	<i>e</i>	<i>f</i>	<i>g</i>																													
1.	<table style="border-collapse: collapse; margin: 0 auto;"> <tr><td style="padding: 0 5px;">635</td></tr> <tr><td style="padding: 0 5px;">+251</td></tr> <tr><td style="border-top: 1px solid black; padding: 0 5px;">886</td></tr> </table>	635	+251	886	<table style="border-collapse: collapse; margin: 0 auto;"> <tr><td style="padding: 0 5px;">253</td></tr> <tr><td style="padding: 0 5px;">+646</td></tr> <tr><td style="border-top: 1px solid black; padding: 0 5px;">899</td></tr> </table>	253	+646	899	<table style="border-collapse: collapse; margin: 0 auto;"> <tr><td style="padding: 0 5px;">514</td></tr> <tr><td style="padding: 0 5px;">+275</td></tr> <tr><td style="border-top: 1px solid black; padding: 0 5px;">789</td></tr> </table>	514	+275	789	<table style="border-collapse: collapse; margin: 0 auto;"> <tr><td style="padding: 0 5px;">671</td></tr> <tr><td style="padding: 0 5px;">+273</td></tr> <tr><td style="border-top: 1px solid black; padding: 0 5px;">944</td></tr> </table>	671	+273	944	<table style="border-collapse: collapse; margin: 0 auto;"> <tr><td style="padding: 0 5px;">687</td></tr> <tr><td style="padding: 0 5px;">+182</td></tr> <tr><td style="border-top: 1px solid black; padding: 0 5px;">869</td></tr> </table>	687	+182	869	<table style="border-collapse: collapse; margin: 0 auto;"> <tr><td style="padding: 0 5px;">449</td></tr> <tr><td style="padding: 0 5px;">+262</td></tr> <tr><td style="border-top: 1px solid black; padding: 0 5px;">711</td></tr> </table>	449	+262	711	<table style="border-collapse: collapse; margin: 0 auto;"> <tr><td style="padding: 0 5px;">385</td></tr> <tr><td style="padding: 0 5px;">+126</td></tr> <tr><td style="border-top: 1px solid black; padding: 0 5px;">511</td></tr> </table>	385	+126	511								
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116																																				
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283																																				
281																																				
+158																																				
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167																																				

The ones column was added first, then the tens column, and then the hundreds column. Where the sum of a column was greater than nine the form was changed from ones to ones and tens, from tens to tens and hundreds as required.



Choosing the Correct Answer

In problems 1 through 3 below, you will be given a choice of three possible answers. You are to decide which answer you think is correct. For example:

Billy had 138 stamps. His uncle gave him 33 stamps. How many stamps did Billy have then? Tell which answer seems sensible: 171 stamps, 105 stamps, or 160 stamps.

To help you decide, *think*: 138 is almost 140. 33 is close to 30. $140 + 30 = 170$. Which of the answers given is nearest to 170? Billy had 171 stamps.

Oral Read each problem carefully. Look at the answers and tell which you think is right and why.

1. Ann saved \$.75. She spent \$.39 for a belt. How much money did she have then? (\$1.14, \$.36, \$1.00)
 $.75 - .39 = \square$
2. Dorothy weighs 98 pounds. Janet weighs 88 pounds. How much more does Dorothy weigh than Janet? (170 pounds, 10 pounds, 186 pounds) $98 - 88 = \square$
3. Dick's father drove 125 miles in the morning and 37 miles in the afternoon. How far did he drive that day? (162 miles, 88 miles, 170 miles) $125 + 37 = \square$

Written First write the answer you chose for each story problem above. Then write the arithmetic statement for each problem and solve it to see if the answer you chose was correct. See above.

Problems Without Numbers

The problems on this page do not have numbers. As you read each problem, *think*: Would I answer the problem question by putting groups, or sets, together? If so, I would add. Would I answer the problem question by taking sets apart, or by finding by how many one set is greater than another? If so, I would subtract.

Oral Tell whether you would add or subtract to solve each of these problems. Tell why.

1. Marvin knows the prices of a toy airplane and of a toy boat. How can he find the cost of both? *Add; sets are joined*
2. Sally's mother knows how many cookies she must make for a picnic. She knows how many she has made. How can she find how many more she needs? *Subtract; sets are compared*
3. You know the price of a hat, a coat, and a pair of shoes. How can you find the cost of all of them? *Add; sets are joined*
4. Annette knows how much money she has and how much a new coat costs. How can she find out how much money will be left if she buys the coat? *Subtract; a set is taken apart*
5. Carl knows how many marbles he has and how many marbles Paul has. How can Carl find how many fewer marbles he has than Paul? *Subtract; sets are compared*
6. Phyllis knows her age and the age of her father. How can she find the difference between their ages? *Subtract; sets are compared*

Written Supply sensible numbers for each problem above. Write the statement for your problem. Then use the numbers in solving each of the problems. *Answers will vary.*

Helping Yourself Solve Problems

If you are not sure how to solve a problem, try pretending that the problem is about something that happened to you. Use smaller numbers in the problem so it will seem easier. Problem A below is one you might find in a book. Problem B is one you might make up.

A. Ted's father drove 287 miles to visit friends. Returning another way, he drove 507 miles. How far did he drive altogether? $287+507=\square$ 794
miles

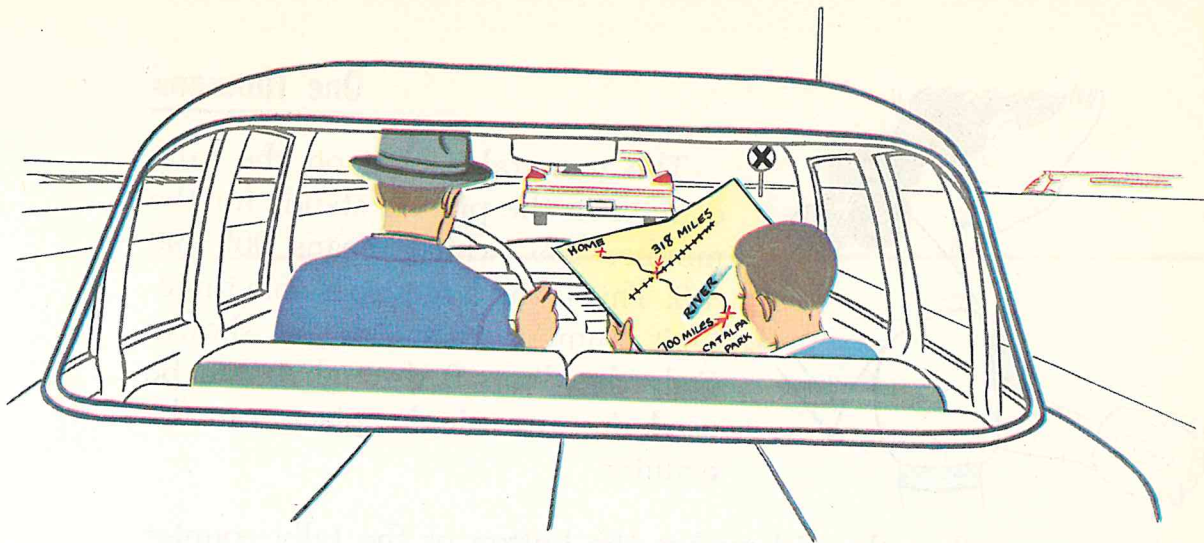
B. I walked 3 blocks to visit friends. Returning another way, I walked 5 blocks. How far did I walk altogether? $3+5=\square$
8 blocks

Oral Answer these questions.

1. Who did something in problem A? In problem B?
Ted's father; I
2. What did the person do in problem A? In problem B?
Drove; walked
3. What question is asked in A? In B? How far; how far
4. In the language of arithmetic, how would you write problem B? Problem A? Problem D below? Problem C below? What is the answer to A? B? C? D?

C. Bill's father bought 500 sheets of paper. After he used some, Bill counted the remaining sheets. There were 119. How many sheets of paper had been used? $500-119=\square$
381 sheets

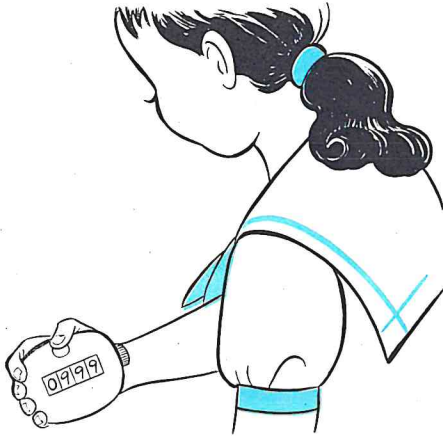
D. Bill bought 5 candy bars. He ate some. He counted 2 candy bars he hadn't eaten. How many candy bars did he eat?
 $5-2=\square$ 3 candy bars



Written Write the arithmetic statement for each problem below. Solve it. Read the problem again to see if your answer seems sensible. If so, write the answer.

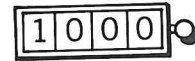
1. George needs 260 pictures to fill his album. He has 185 pictures in the album. How many more pictures can he put in the album? $260-185=\square$ 75 pictures
2. Doris and her mother drove 387 miles on Sunday and 419 miles on Monday. How many miles did they drive on both days? $387+419=\square$ 806 miles
3. A school had 719 pupils when everyone was present. This was 150 more pupils than the school was planned for. How many pupils was the school planned for? $719-150=\square$ 569 pupils
4. A farmer had 275 chickens. He sold all but 69 of them. How many chickens did he sell? $275-69=\square$ 206 chickens
5. Bill and his father have traveled 318 miles. They are taking a 700 mile trip. How much farther must they travel? $700-318=\square$ 382 miles

One Thousand



The numeral shown on the tally counter in the picture stands for the number 999, which means $900 + 90 + 9$. This is the largest possible three-digit number that can be shown. Only the digits 0 through 9 can be used in any single place on the counter.

When the girl pushes the button of the tally counter again, 1 will be added to the 9 ones. 0 will appear in the ones place and 1 ten will be added to the 9 tens. 0 will appear in the tens place and 1 hundred will be added to the 9 hundreds. 0 will then appear in the hundreds place and 1 will appear in the fourth place from the right. This place is for **thousands**. The numeral 1000 will show in the window as at the right. The counter now shows 1 thousand, 0 hundreds, 0 tens, and 0 ones. 1000 is read *one thousand*.



The statements below show what happens when 1 is added to 999. *Reminder:* The () show which step is to be done first.

$$900 + 90 + (9 + 1) = 900 + 90 + 10$$

$$900 + (90 + 10) = 900 + 100$$

$$900 + 100 = 10 \text{ hundreds, or } 1000$$

1000 is equal in value to *ten* hundreds, or to *one hundred* tens, or to *one thousand* ones.

Numerals that have places for thousands, hundreds, tens, and ones are called four-digit numerals. The numerals in the chart at the right are all four-digit numerals. The numeral 1001 means 1 thousand, 0 hundreds, 0 tens, and 1 one, or $1000 + 1$. It is read *one thousand one*. The numeral 1010 means 1 thousand, 0 hundreds, 1 ten, and 0 ones, or $1000 + 10$. It is read *one thousand ten*. 2503 means 2 thousands, 5 hundreds, 0 tens, and 3 ones, or $2000 + 500 + 3$. It is read *two thousand, five hundred three*.

Thousands	Hundreds	Tens	Ones
↓	↓	↓	↓
1	0	0	1
1	0	1	0
1	0	9	9
1	1	0	0
2	5	0	3
6	4	2	1
3	6	9	7
2	8	1	6
7	5	6	3
2	2	2	2

Oral Read each of the numerals shown at the right. See below.

Written Make a grid using $_{Th}$ for thousand, $_H$ for hundreds, $_T$ for tens, and $_O$ for ones. On it write the numerals for the following number words. The first one is done for you.

	Th	H	T	O
1. two thousand four hundred twenty-two	2	4	2	2
2. three thousand eight	3	0	0	8
3. four thousand five hundred six	4	5	0	6
4. nine thousand three hundred seventy-seven	9	3	7	7
5. six thousand five hundred eighty-three	6	5	8	3

Can you do this? 7642 is the largest number you can name using the digits 6, 2, 4, and 7. What is the smallest number you can name with the digits 7, 6, 4, and 2? 2467

One thousand one; one thousand ten; one thousand ninety-nine; one thousand one hundred; two thousand, 173 five hundred three; six thousand, four hundred twenty-one; three thousand, six hundred ninety-seven; two thousand, eight hundred sixteen; seven thousand, five hundred sixty-three; two thousand two hundred twenty-two

Changing the Form of Hundreds to Thousands

Can you add 650 to 925? Look at the picture below. Then you can see how the addition can be done.

$\begin{array}{r} 925 \\ +650 \\ \hline \end{array}$	$\xleftarrow{1}$ thousand	9 hundreds +6 hundreds	2 tens 5 tens	5 ones 0 ones
	1 thousand	15 hundreds	7 tens	5 ones

The addition can also be done on a grid as shown. You add the ones, then the tens, then the hundreds. There are 15 hundreds. Since you cannot write more than 9 hundreds in the hundreds place, you must change the form of 15 hundreds to 1 thousand and 5 hundreds. Where are the 5 hundreds written? Where is the 1 thousand written? How much is the sum of 925 and 650?

Th	H	T	O
1	9	2	5
+	6	5	0
1	5	7	5

925
+650
1575

Oral Supply the missing number word in each of the following statements.

1. 11 hundreds = one thousand + one hundred
2. 17 hundreds = one thousand + seven hundreds

Written Copy. Write each sum. Check.

	<i>a</i>	<i>b</i>	<i>c</i>	<i>d</i>	<i>e</i>	<i>f</i>	<i>g</i>
1.	$\begin{array}{r} 743 \\ +832 \\ \hline 1575 \end{array}$	$\begin{array}{r} 753 \\ +316 \\ \hline 1069 \end{array}$	$\begin{array}{r} 864 \\ +225 \\ \hline 1089 \end{array}$	$\begin{array}{r} 772 \\ +922 \\ \hline 1694 \end{array}$	$\begin{array}{r} 862 \\ +716 \\ \hline 1578 \end{array}$	$\begin{array}{r} 872 \\ +811 \\ \hline 1683 \end{array}$	$\begin{array}{r} 863 \\ +334 \\ \hline 1197 \end{array}$
2.	$\begin{array}{r} 754 \\ +724 \\ \hline 1478 \end{array}$	$\begin{array}{r} 882 \\ +513 \\ \hline 1395 \end{array}$	$\begin{array}{r} 753 \\ +433 \\ \hline 1186 \end{array}$	$\begin{array}{r} 812 \\ +424 \\ \hline 1236 \end{array}$	$\begin{array}{r} 752 \\ +547 \\ \hline 1299 \end{array}$	$\begin{array}{r} 812 \\ +634 \\ \hline 1446 \end{array}$	$\begin{array}{r} 743 \\ +625 \\ \hline 1368 \end{array}$

Reviewing Addition

Oral Read. Replace each \square with the correct numeral.

- | <i>a</i> | <i>b</i> | <i>c</i> |
|--|---------------------------------------|---------------------------------------|
| 1. $472 + 37 = \square$ ⁵⁰⁹ | $365 + 84 = \square$ ⁴⁴⁹ | $752 + 64 = \square$ ⁸¹⁶ |
| 2. $584 + 27 = \square$ ⁶¹¹ | $874 + 86 = \square$ ⁹⁶⁰ | $285 + 95 = \square$ ³⁸⁰ |
| 3. $324 + 253 = \square$ ⁵⁷⁷ | $557 + 223 = \square$ ⁷⁸⁰ | $423 + 285 = \square$ ⁷⁰⁸ |
| 4. $600 + 700 = \square$ ¹³⁰⁰ | $624 + 835 = \square$ ¹⁴⁵⁹ | $720 + 880 = \square$ ¹⁶⁰⁰ |
| 5. $158 + 732 = \square$ ⁸⁹⁰ | $457 + 738 = \square$ ¹¹⁹⁵ | $685 + 652 = \square$ ¹³³⁷ |

Written Copy. Write each sum. Check.

- | | <i>a</i> | <i>b</i> | <i>c</i> | <i>d</i> | <i>e</i> | <i>f</i> |
|----|---|---|---|---|---|---|
| 1. | $\begin{array}{r} 655 \\ +74 \\ \hline 729 \end{array}$ | $\begin{array}{r} 786 \\ +53 \\ \hline 839 \end{array}$ | $\begin{array}{r} 364 \\ +94 \\ \hline 458 \end{array}$ | $\begin{array}{r} 375 \\ +63 \\ \hline 438 \end{array}$ | $\begin{array}{r} 443 \\ +84 \\ \hline 527 \end{array}$ | $\begin{array}{r} 243 \\ +93 \\ \hline 336 \end{array}$ |
| 2. | $\begin{array}{r} 276 \\ +77 \\ \hline 353 \end{array}$ | $\begin{array}{r} 495 \\ +68 \\ \hline 563 \end{array}$ | $\begin{array}{r} 888 \\ +67 \\ \hline 955 \end{array}$ | $\begin{array}{r} 699 \\ +79 \\ \hline 778 \end{array}$ | $\begin{array}{r} 378 \\ +38 \\ \hline 416 \end{array}$ | $\begin{array}{r} 165 \\ +59 \\ \hline 224 \end{array}$ |
| 3. | $\begin{array}{r} 215 \\ +561 \\ \hline 776 \end{array}$ | $\begin{array}{r} 678 \\ +211 \\ \hline 889 \end{array}$ | $\begin{array}{r} 564 \\ +354 \\ \hline 918 \end{array}$ | $\begin{array}{r} 272 \\ +461 \\ \hline 733 \end{array}$ | $\begin{array}{r} 178 \\ +586 \\ \hline 764 \end{array}$ | $\begin{array}{r} 567 \\ +264 \\ \hline 831 \end{array}$ |
| 4. | $\begin{array}{r} 463 \\ 47 \\ +26 \\ \hline 536 \end{array}$ | $\begin{array}{r} 351 \\ 76 \\ +48 \\ \hline 475 \end{array}$ | $\begin{array}{r} 243 \\ 257 \\ +182 \\ \hline 682 \end{array}$ | $\begin{array}{r} 647 \\ 130 \\ +155 \\ \hline 932 \end{array}$ | $\begin{array}{r} 296 \\ 401 \\ +235 \\ \hline 932 \end{array}$ | $\begin{array}{r} 481 \\ 102 \\ +339 \\ \hline 922 \end{array}$ |

Can you do this? Look at the additions below. Some of the numerals in the addends are missing. Copy each addition and supply the missing numerals.

- | <i>a</i> | <i>b</i> | <i>c</i> | <i>d</i> |
|--|--|---|--|
| $\begin{array}{r} 6 \square 2 \\ +35 \\ \hline 97 \end{array}$ | $\begin{array}{r} 5 \square 5 \\ +36 \\ \hline 91 \end{array}$ | $\begin{array}{r} \square 57 \\ +463 \\ \hline 820 \end{array}$ | $\begin{array}{r} 4 \square 8 \\ +74 \square \\ \hline 1213 \end{array}$ |

Addition with a Four-Digit Addend

In the addition below, one of the addends is a four-digit addend. Which one is it?

4 thousands	6 hundreds	2 tens	5 ones	4625
+	1 hundred	7 tens	3 ones	+173
4 thousands	7 hundreds	9 tens	8 ones	4798

You add thousands in the same way that you add ones, tens, or hundreds. In the picture above, find the sum of the ones, then the sum of the tens, and then the sum of the hundreds. There are no thousands to add. 4 thousands is written as part of the sum. The sum is 4 thousands, 7 hundreds, 9 tens, and 8 ones, or 4798.

Oral Read. Tell how to find each sum. Tell the sum.

See preceding paragraph.

- | | | |
|---------------------------|------------------------|------------------------|
| <i>a</i> | <i>b</i> | <i>c</i> |
| 5992 | 9997 | 8848 |
| 1. $5260 + 732 = \square$ | $9463 + 534 = \square$ | $8326 + 522 = \square$ |
| 7968 | 8891 | 4798 |
| 2. $7724 + 244 = \square$ | $8381 + 510 = \square$ | $4307 + 491 = \square$ |

Written Copy. Write each sum. Check.

- | | | | | | |
|--|---|---|---|---|---|
| <i>a</i> | <i>b</i> | <i>c</i> | <i>d</i> | <i>e</i> | <i>f</i> |
| 1. $\begin{array}{r} 9275 \\ +223 \\ \hline \end{array}$ | $\begin{array}{r} 6080 \\ +910 \\ \hline \end{array}$ | $\begin{array}{r} 1234 \\ +143 \\ \hline \end{array}$ | $\begin{array}{r} 5123 \\ +234 \\ \hline \end{array}$ | $\begin{array}{r} 4007 \\ +562 \\ \hline \end{array}$ | $\begin{array}{r} 7541 \\ +428 \\ \hline \end{array}$ |
| 9498 | 6990 | 1377 | 5357 | 4569 | 7969 |
| 2. $\begin{array}{r} 2252 \\ +637 \\ \hline \end{array}$ | $\begin{array}{r} 4120 \\ +579 \\ \hline \end{array}$ | $\begin{array}{r} 7062 \\ +325 \\ \hline \end{array}$ | $\begin{array}{r} 1640 \\ +258 \\ \hline \end{array}$ | $\begin{array}{r} 3801 \\ +132 \\ \hline \end{array}$ | $\begin{array}{r} 1000 \\ +123 \\ \hline \end{array}$ |
| 2889 | 4699 | 7387 | 1898 | 3933 | 1123 |
| 3. $\begin{array}{r} 1721 \\ 143 \\ 112 \\ +413 \\ \hline \end{array}$ | $\begin{array}{r} 9013 \\ 120 \\ 132 \\ +413 \\ \hline \end{array}$ | $\begin{array}{r} 201 \\ 7000 \\ 136 \\ +210 \\ \hline \end{array}$ | $\begin{array}{r} 440 \\ 110 \\ 213 \\ +3005 \\ \hline \end{array}$ | $\begin{array}{r} 1231 \\ 110 \\ 220 \\ +314 \\ \hline \end{array}$ | $\begin{array}{r} 432 \\ 114 \\ 211 \\ +8010 \\ \hline \end{array}$ |
| 2389 | 9678 | 7547 | 3768 | 1875 | 8767 |

Practicing Addition

The additions below have been done for you.

$$\begin{array}{r} \text{Th} | \text{H} | \text{T} | \text{O} \\ 1 \quad 3 \quad 6 \quad 4 \quad 7 \\ + 5 \quad 2 \quad 1 \\ \hline 4 \quad 1 \quad 6 \quad 8 \end{array}$$

$$\begin{array}{r} \text{Th} | \text{H} | \text{T} | \text{O} \\ 1 \quad 4 \quad 7 \quad 5 \\ + 6 \quad 4 \quad 6 \quad 3 \\ \hline 6 \quad 9 \quad 3 \quad 8 \end{array}$$

$$\begin{array}{r} \text{Th} | \text{H} | \text{T} | \text{O} \\ 1 \quad 7 \quad 6 \quad 5 \\ + 8 \quad 9 \quad 7 \quad 3 \\ \hline 9 \quad 7 \quad 3 \quad 8 \end{array}$$

$$\begin{array}{r} \text{Th} | \text{H} | \text{T} | \text{O} \\ 1 \quad 6 \quad 2 \quad 6 \\ + 5 \quad 9 \quad 8 \quad 5 \\ \hline 6 \quad 6 \quad 1 \quad 1 \end{array}$$

In A the sum of the ones is less than 10. The sum of the tens is also less than 10. The sum of the hundreds is 11 hundreds. What change in form was made before the sum could be written correctly? How was the sum written?

In B the sum of the tens is greater than 10. What change in form was made in order to complete the addition and write the sum correctly? What changes in form were needed in C? In D?

Oral In rows 1 and 2, tell which additions require a change in form. Tell which changes are necessary.

See below.

	a	b	c	d	e	f
1.	$\begin{array}{r} 9795 \\ +203 \\ \hline 9998 \end{array}$	$\begin{array}{r} 4000 \\ +601 \\ \hline 4601 \end{array}$	$\begin{array}{r} 454 \\ +5233 \\ \hline 5687 \end{array}$	$\begin{array}{r} 5280 \\ +900 \\ \hline 6180 \end{array}$	$\begin{array}{r} 729 \\ +3570 \\ \hline 4299 \end{array}$	$\begin{array}{r} 6960 \\ +502 \\ \hline 7462 \end{array}$
2.	$\begin{array}{r} 6584 \\ +254 \\ \hline 6838 \end{array}$	$\begin{array}{r} 470 \\ +1290 \\ \hline 1760 \end{array}$	$\begin{array}{r} 8572 \\ +230 \\ \hline 8802 \end{array}$	$\begin{array}{r} 942 \\ +1085 \\ \hline 2027 \end{array}$	$\begin{array}{r} 276 \\ +2632 \\ \hline 2908 \end{array}$	$\begin{array}{r} 7999 \\ +990 \\ \hline 8989 \end{array}$
3.	$\begin{array}{r} 5231 \\ 451 \\ +632 \\ \hline 6314 \end{array}$	$\begin{array}{r} 460 \\ 5215 \\ +614 \\ \hline 6289 \end{array}$	$\begin{array}{r} 432 \\ 392 \\ +6143 \\ \hline 6967 \end{array}$	$\begin{array}{r} 6424 \\ 350 \\ +266 \\ \hline 7040 \end{array}$	$\begin{array}{r} 975 \\ 4630 \\ +271 \\ \hline 5876 \end{array}$	$\begin{array}{r} 462 \\ 534 \\ +7950 \\ \hline 8946 \end{array}$

Written Copy rows 1 through 3 above. Write each sum.
See above.

The following additions require changes in the columns shown:

1. d, hundreds; e, hundreds; f, hundreds
2. a, tens; b, tens; c, tens; d, tens and hundreds; e, tens; f, tens and hundreds

3 thousands	2 hundreds	3 tens	5 ones	3235
+ 4 thousands	1 hundred	2 tens	4 ones	+ 4124
7 thousands	3 hundreds	5 tens	9 ones	7359

Adding Four-Digit Numbers

Thousands are added in the same way as ones and tens. No changes in form were needed in the example on the board. However, you will always need to change the form of a number when the sum in any place is greater than 9.

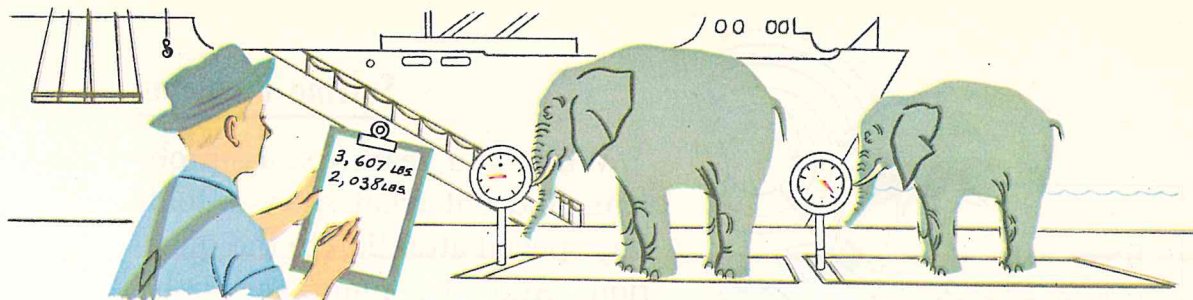
Look at the additions below. The reminder numerals will help you see which changes in form were needed.

A	$\begin{array}{r} \overset{1}{8}843 \\ +1082 \\ \hline 9925 \end{array}$	B	$\begin{array}{r} \overset{1}{6}406 \\ +1703 \\ \hline 8109 \end{array}$	C	$\begin{array}{r} \overset{1}{7}602 \\ +1299 \\ \hline 8901 \end{array}$	D	$\begin{array}{r} \overset{1}{5}\overset{1}{6}\overset{1}{8}5 \\ +2397 \\ \hline 8082 \end{array}$
---	--	---	--	---	--	---	--

Oral Answer these questions. See T179 for answers.

1. How was the form of 12 tens changed in A? What was done with the 2 tens? With the 1 hundred?
2. What is the sum of hundreds in B?
3. Which changes in form were made in C? Why?
4. Which changes in form were made in D? Why?
5. Tell how to find each sum below. Then tell the sum.

<i>a</i>	<i>b</i>	<i>c</i>	<i>d</i>	<i>e</i>	<i>f</i>
2101	1621	3172	1662	2430	3381
3250	3201	2061	1781	1923	1460
+1403	+2732	+3970	+5962	+2961	+4928
<u>6754</u>	<u>7554</u>	<u>9203</u>	<u>9405</u>	<u>7314</u>	<u>9769</u>



Written Copy. Write each sum. Check.

	<i>a</i>	<i>b</i>	<i>c</i>	<i>d</i>	<i>e</i>	<i>f</i>
1.	$\begin{array}{r} 3607 \\ +2038 \\ \hline \end{array}$	$\begin{array}{r} 4076 \\ +5008 \\ \hline \end{array}$	$\begin{array}{r} 7565 \\ +1325 \\ \hline \end{array}$	$\begin{array}{r} 6362 \\ +2918 \\ \hline \end{array}$	$\begin{array}{r} 4226 \\ +2805 \\ \hline \end{array}$	$\begin{array}{r} 7846 \\ +1309 \\ \hline \end{array}$
	5645	9084	8890	9280	7031	9155
2.	$\begin{array}{r} 3677 \\ +5787 \\ \hline \end{array}$	$\begin{array}{r} 7842 \\ +1058 \\ \hline \end{array}$	$\begin{array}{r} 6655 \\ +2255 \\ \hline \end{array}$	$\begin{array}{r} 2269 \\ +3989 \\ \hline \end{array}$	$\begin{array}{r} 4675 \\ +3986 \\ \hline \end{array}$	$\begin{array}{r} 6686 \\ +2397 \\ \hline \end{array}$
	9464	8900	8910	6258	8661	9083
3.	$\begin{array}{r} 4735 \\ +1246 \\ \hline \end{array}$	$\begin{array}{r} 1300 \\ +5784 \\ \hline \end{array}$	$\begin{array}{r} 2265 \\ +5824 \\ \hline \end{array}$	$\begin{array}{r} 7846 \\ +1309 \\ \hline \end{array}$	$\begin{array}{r} 5501 \\ +4276 \\ \hline \end{array}$	$\begin{array}{r} 4312 \\ +3857 \\ \hline \end{array}$
	5981	7084	8089	9155	9777	8169
4.	$\begin{array}{r} \$25.95 \\ +14.98 \\ \hline \end{array}$	$\begin{array}{r} \$14.98 \\ +32.50 \\ \hline \end{array}$	$\begin{array}{r} \$37.49 \\ +56.55 \\ \hline \end{array}$	$\begin{array}{r} \$42.75 \\ +42.50 \\ \hline \end{array}$	$\begin{array}{r} \$64.98 \\ +22.98 \\ \hline \end{array}$	$\begin{array}{r} \$36.59 \\ +27.84 \\ \hline \end{array}$
	\$40.93	\$47.48	\$94.04	\$85.25	\$87.96	\$64.43
5.	$\begin{array}{r} 1326 \\ 1012 \\ +2134 \\ \hline \end{array}$	$\begin{array}{r} 2020 \\ 1026 \\ +1708 \\ \hline \end{array}$	$\begin{array}{r} 3746 \\ 1059 \\ +2047 \\ \hline \end{array}$	$\begin{array}{r} 2765 \\ 1609 \\ +3579 \\ \hline \end{array}$	$\begin{array}{r} 2428 \\ 1963 \\ +3450 \\ \hline \end{array}$	$\begin{array}{r} 1756 \\ 2638 \\ +1496 \\ \hline \end{array}$
	4472	4754	6852	7953	7841	5890
6.	$\begin{array}{r} 4361 \\ 1122 \\ 1200 \\ +2247 \\ \hline \end{array}$	$\begin{array}{r} 2479 \\ 2553 \\ 1276 \\ +3254 \\ \hline \end{array}$	$\begin{array}{r} 1678 \\ 5064 \\ 1353 \\ +1197 \\ \hline \end{array}$	$\begin{array}{r} 3537 \\ 1688 \\ 2246 \\ +1903 \\ \hline \end{array}$	$\begin{array}{r} 1523 \\ 1631 \\ 2014 \\ +2201 \\ \hline \end{array}$	$\begin{array}{r} 3463 \\ 1070 \\ 2132 \\ +1350 \\ \hline \end{array}$
	8930	9562	9292	9374	7369	8015

A quick review

	<i>a</i>	<i>b</i>	<i>c</i>	<i>d</i>
1.	$26 - 7 = \square$	$28 - 9 = \square$	$27 - 9 = \square$	$25 - 8 = \square$
	19	19	18	17
2.	$56 - 7 = \square$	$68 - 9 = \square$	$77 - 9 = \square$	$45 - 8 = \square$
	49	59	68	37
3.	$32 - 27 = \square$	$93 - 36 = \square$	$41 - 13 = \square$	$57 - 29 = \square$
	5	57	28	28

MORE PRACTICE

PAGE 310



Solving Problems

When you read a story problem, find out what story is told. Pay special attention to the question. Add the numbers if the groups, or sets, are to be put together. Subtract the numbers if a group, or set, is to be taken apart, or if you are to find by how many one set differs from another.

Oral Be ready to tell the arithmetic statement you will use in solving each problem below. Tell why you decided as you did.

1. A crowd of 1679 people saw the first football game of the year. 1819 people saw the second game. How many people saw both games? $1679+1819=\square$
 3498 people
2. Dick's father had 75 books in a box in the attic. He gave 49 of them away during a book drive. How many did he keep? $75-49=\square$ 26 books
3. The driver of a tank truck delivered 550 gallons of oil at one house. He then had only 634 gallons of oil left in the truck. With how many gallons had he started? $550+634=\square$ 1184 gallons
4. The Empire State Building is 1472 feet high. An airplane flew 8000 feet over the top of the building. How high above the ground was the airplane?
 $8000+1472=\square$ 9472 feet

Written Write the arithmetic statement for each problem above and solve it. See above.

Checkup Time

The numerals in () tell the pages where you can turn for help if you need it.

Important Ideas

1. You add hundreds in the same way you add ones and tens. (164)

2. In a numeral, the digit in the 4th place from the right stands for thousands. (172)

3. 10 hundreds are equal in value to 1 thousand. (172)

4. You can add thousands in the same way you add ones, tens, and hundreds. (176)

4. What steps do you take when you add as in the addition at the right? Why? (176)

$$\begin{array}{r} 3746 \\ +243 \\ \hline 3989 \end{array}$$

5. What changes in form are made in the addition at the right? Why? (177)

$$\begin{array}{r} 6539 \\ +462 \\ \hline 7001 \end{array}$$

6. How do you add 2397 to 5685? (178)

Written Practice

Copy. Write each sum. Check.
(166, 176, 178)

Questions to Discuss

See T181 for answers.

1. How can you decide upon the arithmetic statement to use after you read a story problem? (169, 170)

2. What changes in the form of 999 take place when you add 1 to it? (172)

3. How do you read each of these numerals: 1001, 1010, 2503, 1736, 6485? (173)

	<i>a</i>	<i>b</i>	<i>c</i>
1.	$\begin{array}{r} 85 \\ 708 \\ +32 \\ \hline 825 \end{array}$	$\begin{array}{r} 38 \\ 24 \\ +208 \\ \hline 270 \end{array}$	$\begin{array}{r} \$.46 \\ 2.65 \\ +.56 \\ \hline \$3.67 \end{array}$
2.	$\begin{array}{r} 5231 \\ +647 \\ \hline 5878 \end{array}$	$\begin{array}{r} 7682 \\ +359 \\ \hline 8041 \end{array}$	$\begin{array}{r} \$67.43 \\ +13.98 \\ \hline \$81.41 \end{array}$
3.	$\begin{array}{r} 3450 \\ 1496 \\ +1609 \\ \hline 6555 \end{array}$	$\begin{array}{r} 2134 \\ 1926 \\ +1059 \\ \hline 5119 \end{array}$	$\begin{array}{r} 2765 \\ 2746 \\ +1012 \\ \hline 6523 \\ 181 \end{array}$

Self-Evaluation

Part 1 Copy. Write each difference. Check.

	<i>a</i>	<i>b</i>	<i>c</i>	<i>d</i>
1.	$\begin{array}{r} 9 \\ -6 \\ \hline 3 \end{array}$	$\begin{array}{r} 15 \\ -9 \\ \hline 6 \end{array}$	$\begin{array}{r} 27 \\ -5 \\ \hline 22 \end{array}$	$\begin{array}{r} 35 \\ -7 \\ \hline 28 \end{array}$
2.	$\begin{array}{r} 40 \\ -6 \\ \hline 34 \end{array}$	$\begin{array}{r} 51 \\ -3 \\ \hline 48 \end{array}$	$\begin{array}{r} 14 \\ -9 \\ \hline 5 \end{array}$	$\begin{array}{r} 67 \\ -8 \\ \hline 59 \end{array}$
3.	$\begin{array}{r} 43 \\ -21 \\ \hline 22 \end{array}$	$\begin{array}{r} 83 \\ -24 \\ \hline 59 \end{array}$	$\begin{array}{r} 37 \\ -29 \\ \hline 8 \end{array}$	$\begin{array}{r} 40 \\ -20 \\ \hline 20 \end{array}$
4.	$\begin{array}{r} 58 \\ -26 \\ \hline 32 \end{array}$	$\begin{array}{r} 69 \\ -45 \\ \hline 24 \end{array}$	$\begin{array}{r} 46 \\ -29 \\ \hline 17 \end{array}$	$\begin{array}{r} 84 \\ -50 \\ \hline 34 \end{array}$

Part 2 Copy. Write each sum.

	<i>a</i>	<i>b</i>	<i>c</i>
1.	$\begin{array}{r} 421 \\ 32 \\ +16 \\ \hline 469 \end{array}$	$\begin{array}{r} 411 \\ 124 \\ +362 \\ \hline 897 \end{array}$	$\begin{array}{r} 323 \\ 116 \\ +231 \\ \hline 670 \end{array}$
2.	$\begin{array}{r} \$4.37 \\ +.21 \\ \hline \$4.58 \end{array}$	$\begin{array}{r} \$3.14 \\ +2.43 \\ \hline \$5.57 \end{array}$	$\begin{array}{r} \$5.87 \\ +2.76 \\ \hline \$8.63 \end{array}$
3.	$\begin{array}{r} 232 \\ 1469 \\ +425 \\ \hline 2126 \end{array}$	$\begin{array}{r} 174 \\ 9432 \\ +178 \\ \hline 9784 \end{array}$	$\begin{array}{r} 522 \\ 6421 \\ +594 \\ \hline 7537 \end{array}$
4.	$\begin{array}{r} 2463 \\ 5794 \\ +1728 \\ \hline 9985 \end{array}$	$\begin{array}{r} 2143 \\ 3685 \\ +1926 \\ \hline 7754 \end{array}$	$\begin{array}{r} 4291 \\ 2006 \\ +2937 \\ \hline 9234 \end{array}$

Part 3 Write an arithmetic statement for each of these story problems. Solve each problem.

1. There are 274 children in Brady School and 316 children in Carpenter School. How many children are there in both schools?
 $274+316=\square$ 590 children

2. Olive had space for 85 pictures in her picture book. She pasted 37 pictures in the book. How many more pictures did she need to fill her book?
 $85-37=\square$ 48 pictures

3. A cafeteria served 398 lunches on Monday, 375 on Tuesday, 413 on Wednesday, and 405 on Thursday. How many lunches were served in all during the four days?
 $398+375+413+405=\square$ 1591 lunches

4. An airplane was flying at 6900 feet. It went up another 350 feet. Then how many feet high was it flying?
 $6900+350=\square$ 7250 feet

5. A farmer had 1875 chickens in one house and 3455 in another house. How many chickens had he altogether?
 $1875+3455=\square$ 5330 chickens



More About Subtraction

Dick had 169 buttons in his collection and Bob had 45 buttons in his. How many more buttons were in Dick's collection than in Bob's?

To find how many more are in one set than in another, subtract the numbers as shown below.

$\begin{array}{r} 169 \\ -45 \\ \hline \end{array}$	1 hundred 6 tens 9 ones $\begin{array}{r} - \\ \hline \end{array}$ 4 tens 5 ones 1 hundred 2 tens 4 ones	<table border="1"> <thead> <tr> <th>H</th> <th>T</th> <th>O</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>6</td> <td>9</td> </tr> <tr> <td></td> <td>4</td> <td>5</td> </tr> <tr> <td>1</td> <td>2</td> <td>4</td> </tr> </tbody> </table>	H	T	O	1	6	9		4	5	1	2	4	$\begin{array}{r} 169 \\ -45 \\ \hline 124 \end{array}$
H	T	O													
1	6	9													
	4	5													
1	2	4													

If you know how to subtract 45 from 69 you also know how to subtract 45 from 169. Subtract the ones. Then subtract the tens. Write the hundreds in the hundreds place as part of the difference. The difference is 1 hundred, 2 tens, and 4 ones, or 124. Dick had 124 more buttons than Bob.

Oral Read. Tell how to find each difference. See paragraphs above.

a	b	c	d	e	f	g
$\begin{array}{r} 326 \\ -15 \\ \hline 311 \end{array}$	$\begin{array}{r} 849 \\ -24 \\ \hline 825 \end{array}$	$\begin{array}{r} 535 \\ -14 \\ \hline 521 \end{array}$	$\begin{array}{r} 287 \\ -76 \\ \hline 211 \end{array}$	$\begin{array}{r} 690 \\ -60 \\ \hline 630 \end{array}$	$\begin{array}{r} 184 \\ -80 \\ \hline 104 \end{array}$	$\begin{array}{r} 798 \\ -42 \\ \hline 756 \end{array}$

Written Copy a through g. Write each difference. See above.

Changing the Form of a Ten in Subtraction

How would you find the difference in the statement $362 - 48 = \square$? Can you subtract 8 ones from 2 ones? The subtraction can be done as shown below.

A $\begin{array}{r} 362 \\ -48 \\ \hline \end{array}$	B <table style="display: inline-table; border-collapse: collapse;"> <tr> <td style="text-align: center;">3 hundreds</td> <td style="text-align: center;">6⁵⁺¹ tens</td> <td style="text-align: center;">2 ones</td> </tr> <tr> <td style="text-align: center;">—</td> <td style="text-align: center;">4 tens</td> <td style="text-align: center;">8 ones</td> </tr> <tr> <td style="text-align: center;">3 hundreds</td> <td style="text-align: center;">1 ten</td> <td style="text-align: center;">4 ones</td> </tr> </table>	3 hundreds	6 ⁵⁺¹ tens	2 ones	—	4 tens	8 ones	3 hundreds	1 ten	4 ones	C <table style="display: inline-table; border-collapse: collapse;"> <tr> <td style="border-right: 1px solid black; padding: 0 5px;">H</td> <td style="border-right: 1px solid black; padding: 0 5px;">T</td> <td style="padding: 0 5px;">O</td> </tr> <tr> <td style="border-right: 1px solid black; text-align: center;">3</td> <td style="border-right: 1px solid black; text-align: center;">6⁵</td> <td style="text-align: center;">2¹²</td> </tr> <tr> <td style="border-right: 1px solid black; text-align: center;">—</td> <td style="border-right: 1px solid black; text-align: center;">4</td> <td style="text-align: center;">8</td> </tr> <tr> <td style="border-right: 1px solid black; text-align: center;">3</td> <td style="border-right: 1px solid black; text-align: center;">1</td> <td style="text-align: center;">4</td> </tr> </table>	H	T	O	3	6 ⁵	2 ¹²	—	4	8	3	1	4	D $\begin{array}{r} 362 \\ -48 \\ \hline 314 \end{array}$
3 hundreds	6 ⁵⁺¹ tens	2 ones																						
—	4 tens	8 ones																						
3 hundreds	1 ten	4 ones																						
H	T	O																						
3	6 ⁵	2 ¹²																						
—	4	8																						
3	1	4																						

You can think of 6 tens as 5 tens + 1 ten. Then the form of 1 ten can be changed to 10 ones and added to the ones as in B. How many ones are there now? Can you subtract 4 tens from 5 tens?

Look at the grid in C. What do the reminder numerals tell you? The difference between 362 and 48 is 3 hundreds, 1 ten, and 4 ones, or 314.

Oral Tell how to find each difference below. See paragraphs above.

a

$$371 - 57 = \square \quad 314$$

b

$$563 - 26 = \square \quad 537$$

c

$$470 - 44 = \square \quad 426$$

Written Copy. Write each difference. Check.

	<i>a</i>	<i>b</i>	<i>c</i>	<i>d</i>	<i>e</i>	<i>f</i>	<i>g</i>
1.	$\begin{array}{r} 187 \\ -38 \\ \hline 149 \end{array}$	$\begin{array}{r} 776 \\ -38 \\ \hline 738 \end{array}$	$\begin{array}{r} 460 \\ -29 \\ \hline 431 \end{array}$	$\begin{array}{r} 240 \\ -28 \\ \hline 212 \end{array}$	$\begin{array}{r} 887 \\ -78 \\ \hline 809 \end{array}$	$\begin{array}{r} 440 \\ -36 \\ \hline 404 \end{array}$	$\begin{array}{r} 683 \\ -45 \\ \hline 638 \end{array}$
2.	$\begin{array}{r} 585 \\ -29 \\ \hline 556 \end{array}$	$\begin{array}{r} 640 \\ -36 \\ \hline 604 \end{array}$	$\begin{array}{r} 654 \\ -29 \\ \hline 625 \end{array}$	$\begin{array}{r} 220 \\ -16 \\ \hline 204 \end{array}$	$\begin{array}{r} 290 \\ -69 \\ \hline 221 \end{array}$	$\begin{array}{r} 842 \\ -28 \\ \hline 814 \end{array}$	$\begin{array}{r} 896 \\ -47 \\ \hline 849 \end{array}$
3.	$\begin{array}{r} 150 \\ -29 \\ \hline 121 \end{array}$	$\begin{array}{r} 671 \\ -53 \\ \hline 618 \end{array}$	$\begin{array}{r} 484 \\ -15 \\ \hline 469 \end{array}$	$\begin{array}{r} 127 \\ -18 \\ \hline 109 \end{array}$	$\begin{array}{r} 587 \\ -58 \\ \hline 529 \end{array}$	$\begin{array}{r} 498 \\ -59 \\ \hline 439 \end{array}$	$\begin{array}{r} 380 \\ -56 \\ \hline 324 \end{array}$

A	B	C	D															
$\begin{array}{r} 435 \\ -62 \\ \hline \end{array}$	<div><div>3+1</div><div><div><div>4</div><div>hundreds</div></div><div><div>3</div><div>tens</div></div><div><div>5</div><div>ones</div></div></div><div><div>—</div><div>6 tens</div><div>2 ones</div></div><div><div>3 hundreds</div><div>7 tens</div><div>3 ones</div></div></div>	<table><tr><td>H</td><td>T</td><td>O</td></tr><tr><td>3</td><td>13</td><td>0</td></tr><tr><td>4</td><td>3</td><td>5</td></tr><tr><td>—</td><td>6</td><td>2</td></tr><tr><td>3</td><td>7</td><td>3</td></tr></table>	H	T	O	3	13	0	4	3	5	—	6	2	3	7	3	$\begin{array}{r} 435 \\ -62 \\ \hline 373 \end{array}$
H	T	O																
3	13	0																
4	3	5																
—	6	2																
3	7	3																

Changing the Form of a Hundred in Subtraction

Look at the arithmetic statement $435 - 62$ shown in column form in A above. Can you subtract 6 tens from 3 tens? Can you change the form of one of the hundreds to tens?

Look at B. Think of the 4 hundreds as 3 hundreds + 1 hundred. Change the form of the 1 hundred to 10 tens and add them to the 3 tens. How many tens are there? Can you now subtract the ones? The tens? The difference between 62 and 435 is 3 hundreds, 7 tens, and 3 ones, or 373 as shown on the grid in C.

Oral Read. Tell how to find each difference in row 1.
See paragraphs above.

	a	b	c	d	e	f	g
1.	$\begin{array}{r} 845 \\ -61 \\ \hline 784 \end{array}$	$\begin{array}{r} 507 \\ -84 \\ \hline 423 \end{array}$	$\begin{array}{r} 916 \\ -52 \\ \hline 864 \end{array}$	$\begin{array}{r} 565 \\ -93 \\ \hline 472 \end{array}$	$\begin{array}{r} 248 \\ -60 \\ \hline 188 \end{array}$	$\begin{array}{r} 328 \\ -46 \\ \hline 282 \end{array}$	$\begin{array}{r} 412 \\ -81 \\ \hline 331 \end{array}$
2.	$\begin{array}{r} 407 \\ -35 \\ \hline 372 \end{array}$	$\begin{array}{r} 824 \\ -43 \\ \hline 781 \end{array}$	$\begin{array}{r} 412 \\ -81 \\ \hline 331 \end{array}$	$\begin{array}{r} 646 \\ -63 \\ \hline 583 \end{array}$	$\begin{array}{r} 820 \\ -40 \\ \hline 780 \end{array}$	$\begin{array}{r} 953 \\ -62 \\ \hline 891 \end{array}$	$\begin{array}{r} 248 \\ -60 \\ \hline 188 \end{array}$
3.	$\begin{array}{r} 845 \\ -61 \\ \hline 784 \end{array}$	$\begin{array}{r} 328 \\ -46 \\ \hline 282 \end{array}$	$\begin{array}{r} 649 \\ -78 \\ \hline 571 \end{array}$	$\begin{array}{r} 732 \\ -51 \\ \hline 681 \end{array}$	$\begin{array}{r} 507 \\ -84 \\ \hline 423 \end{array}$	$\begin{array}{r} 916 \\ -52 \\ \hline 864 \end{array}$	$\begin{array}{r} 465 \\ -93 \\ \hline 372 \end{array}$

Written Copy rows 1 through 3. Write each difference.
See above.

$\begin{array}{r} 442 \\ - 75 \\ \hline \end{array}$	$3 + 0 \rightarrow 13 + 0$	$\begin{array}{r} 4 \text{ hundreds} \quad 4 \text{ tens} \quad 2 \text{ ones} \\ - 7 \text{ tens} \quad 5 \text{ ones} \\ \hline 3 \text{ hundreds} \quad 6 \text{ tens} \quad 7 \text{ ones} \end{array}$	<table border="1" style="border-collapse: collapse; margin: auto;"> <tr> <td style="padding: 2px;">H</td> <td style="padding: 2px;">T</td> <td style="padding: 2px;">O</td> </tr> <tr> <td style="padding: 2px;">3</td> <td style="padding: 2px;">4 13</td> <td style="padding: 2px;">12</td> </tr> </table>	H	T	O	3	4 13	12	$\begin{array}{r} 442 \\ - 75 \\ \hline 367 \end{array}$
H	T	O								
3	4 13	12								

Changing the Form of Tens and Hundreds

The work on the board shows how to subtract 75 from 442. You cannot subtract 5 ones from 2 ones. Why? Can you subtract 7 tens from 4 tens?

What changes in form were made to subtract 5 ones from 12 ones? What changes in form were made to subtract 7 tens from 13 tens? How many hundreds were left? The difference between 75 and 442 is 3 hundreds, 6 tens, and 7 ones, or 367.

Oral Read. Tell how you would subtract in row 1.

See paragraphs above.

	<i>a</i>	<i>b</i>	<i>c</i>	<i>d</i>	<i>e</i>	<i>f</i>	<i>g</i>
1.	$\begin{array}{r} 372 \\ -96 \\ \hline 276 \end{array}$	$\begin{array}{r} 435 \\ -78 \\ \hline 357 \end{array}$	$\begin{array}{r} 543 \\ -86 \\ \hline 457 \end{array}$	$\begin{array}{r} 527 \\ -59 \\ \hline 468 \end{array}$	$\begin{array}{r} 812 \\ -96 \\ \hline 716 \end{array}$	$\begin{array}{r} 982 \\ -94 \\ \hline 888 \end{array}$	$\begin{array}{r} 465 \\ -78 \\ \hline 387 \end{array}$
2.	$\begin{array}{r} 756 \\ -79 \\ \hline 677 \end{array}$	$\begin{array}{r} 625 \\ -76 \\ \hline 549 \end{array}$	$\begin{array}{r} 324 \\ -48 \\ \hline 276 \end{array}$	$\begin{array}{r} 125 \\ -39 \\ \hline 86 \end{array}$	$\begin{array}{r} 375 \\ -98 \\ \hline 277 \end{array}$	$\begin{array}{r} 575 \\ -76 \\ \hline 499 \end{array}$	$\begin{array}{r} 546 \\ -68 \\ \hline 478 \end{array}$
3.	$\begin{array}{r} 643 \\ -75 \\ \hline 568 \end{array}$	$\begin{array}{r} 142 \\ -75 \\ \hline 67 \end{array}$	$\begin{array}{r} 753 \\ -54 \\ \hline 699 \end{array}$	$\begin{array}{r} 347 \\ -59 \\ \hline 288 \end{array}$	$\begin{array}{r} 622 \\ -57 \\ \hline 565 \end{array}$	$\begin{array}{r} 827 \\ -39 \\ \hline 788 \end{array}$	$\begin{array}{r} 542 \\ -68 \\ \hline 474 \end{array}$

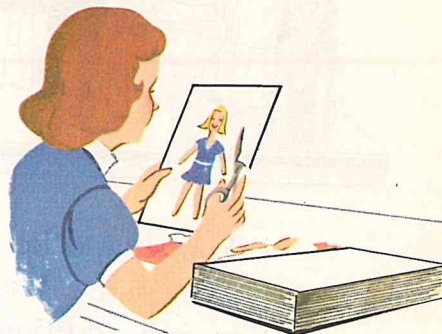
Written Copy rows 1 through 3. Write each difference.

See above.

Changing the Form of Hundreds and Tens

Julie bought a package of paper with 500 sheets in it. She used 67. How many sheets were left?

You are to think of a set as being taken apart, so you subtract the numbers. The arithmetic statement is $500 - 67 = \square$. Can you subtract 7 from 0? Can you subtract 6 from 0?



$$\begin{array}{r} 500 \\ -67 \\ \hline \end{array}$$

4 + 1	9 + 1	
5 hundreds	0 tens	0 ones
	6 tens	7 ones
4 hundreds	3 tens	3 ones

H	T	O
4	0	0
3	0	0
4	3	3

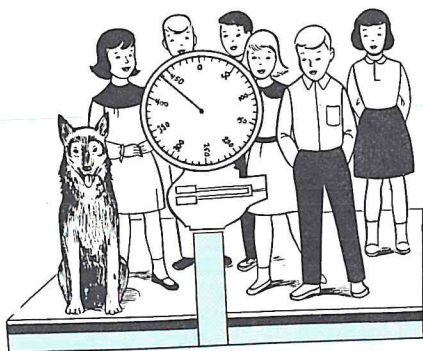
$$\begin{array}{r} 500 \\ -67 \\ \hline 433 \end{array}$$

The difference is 4 hundreds, 3 tens, and 3 ones. Julie had 433 sheets of paper left.

Oral Tell how you would find each difference in row 1.
See paragraphs above.

	a	b	c	d	e	f	g
1.	$\begin{array}{r} 106 \\ -59 \\ \hline 47 \end{array}$	$\begin{array}{r} 142 \\ -48 \\ \hline 94 \end{array}$	$\begin{array}{r} 405 \\ -76 \\ \hline 329 \end{array}$	$\begin{array}{r} 900 \\ -23 \\ \hline 877 \end{array}$	$\begin{array}{r} 104 \\ -23 \\ \hline 81 \end{array}$	$\begin{array}{r} 860 \\ -37 \\ \hline 823 \end{array}$	$\begin{array}{r} 672 \\ -19 \\ \hline 653 \end{array}$
2.	$\begin{array}{r} 123 \\ -30 \\ \hline 93 \end{array}$	$\begin{array}{r} 700 \\ -96 \\ \hline 604 \end{array}$	$\begin{array}{r} 605 \\ -39 \\ \hline 566 \end{array}$	$\begin{array}{r} 829 \\ -62 \\ \hline 767 \end{array}$	$\begin{array}{r} 560 \\ -20 \\ \hline 540 \end{array}$	$\begin{array}{r} 936 \\ -58 \\ \hline 878 \end{array}$	$\begin{array}{r} 608 \\ -52 \\ \hline 556 \end{array}$
3.	$\begin{array}{r} 300 \\ -82 \\ \hline 218 \end{array}$	$\begin{array}{r} 500 \\ -47 \\ \hline 453 \end{array}$	$\begin{array}{r} 275 \\ -31 \\ \hline 244 \end{array}$	$\begin{array}{r} 109 \\ -83 \\ \hline 26 \end{array}$	$\begin{array}{r} 706 \\ -45 \\ \hline 661 \end{array}$	$\begin{array}{r} 560 \\ -29 \\ \hline 531 \end{array}$	$\begin{array}{r} 207 \\ -38 \\ \hline 169 \end{array}$

Written Copy rows 1 through 3. Write each difference.
See above.



Practicing Subtraction

You should be able to do this page all by yourself. Use the fact that subtraction and addition are inverse operations to check as shown at the right. The sum of the subtrahend and difference should equal the minuend.

$$\begin{array}{r} 437 \\ -86 \\ \hline 351 \\ +86 \\ \hline 437 \end{array}$$

Oral Read. Tell how to find the difference in each of the following. Tell what changes in form are necessary.

See below.

a
1. $648 - 53 = \square$ 595

b
 $827 - 36 = \square$ 791

c
 $316 - 54 = \square$ 262

2. $534 - 67 = \square$ 467

$905 - 48 = \square$ 857

$732 - 65 = \square$ 667

Written Copy. Write each difference. Check.

	<i>a</i>	<i>b</i>	<i>c</i>	<i>d</i>	<i>e</i>	<i>f</i>	<i>g</i>
1.	$\begin{array}{r} 187 \\ -54 \\ \hline 133 \end{array}$	$\begin{array}{r} 776 \\ -25 \\ \hline 751 \end{array}$	$\begin{array}{r} 460 \\ -36 \\ \hline 424 \end{array}$	$\begin{array}{r} 896 \\ -53 \\ \hline 843 \end{array}$	$\begin{array}{r} 326 \\ -15 \\ \hline 311 \end{array}$	$\begin{array}{r} 535 \\ -36 \\ \hline 499 \end{array}$	$\begin{array}{r} 287 \\ -55 \\ \hline 232 \end{array}$
2.	$\begin{array}{r} 195 \\ -54 \\ \hline 141 \end{array}$	$\begin{array}{r} 656 \\ -22 \\ \hline 634 \end{array}$	$\begin{array}{r} 586 \\ -24 \\ \hline 562 \end{array}$	$\begin{array}{r} 575 \\ -62 \\ \hline 513 \end{array}$	$\begin{array}{r} 748 \\ -26 \\ \hline 722 \end{array}$	$\begin{array}{r} 675 \\ -44 \\ \hline 631 \end{array}$	$\begin{array}{r} 999 \\ -88 \\ \hline 911 \end{array}$
3.	$\begin{array}{r} 240 \\ -10 \\ \hline 230 \end{array}$	$\begin{array}{r} 275 \\ -62 \\ \hline 213 \end{array}$	$\begin{array}{r} 339 \\ -16 \\ \hline 323 \end{array}$	$\begin{array}{r} 652 \\ -51 \\ \hline 601 \end{array}$	$\begin{array}{r} 960 \\ -50 \\ \hline 910 \end{array}$	$\begin{array}{r} 795 \\ -45 \\ \hline 750 \end{array}$	$\begin{array}{r} 798 \\ -42 \\ \hline 756 \end{array}$
4.	$\begin{array}{r} 676 \\ -70 \\ \hline 606 \end{array}$	$\begin{array}{r} 759 \\ -37 \\ \hline 722 \end{array}$	$\begin{array}{r} 184 \\ -80 \\ \hline 104 \end{array}$	$\begin{array}{r} 879 \\ -79 \\ \hline 800 \end{array}$	$\begin{array}{r} 972 \\ -60 \\ \hline 912 \end{array}$	$\begin{array}{r} 324 \\ -24 \\ \hline 300 \end{array}$	$\begin{array}{r} 765 \\ -25 \\ \hline 740 \end{array}$

Row 1, change hundreds to tens; row 2, change tens to ones and hundreds to tens

Using Addition and Subtraction in Solving Problems

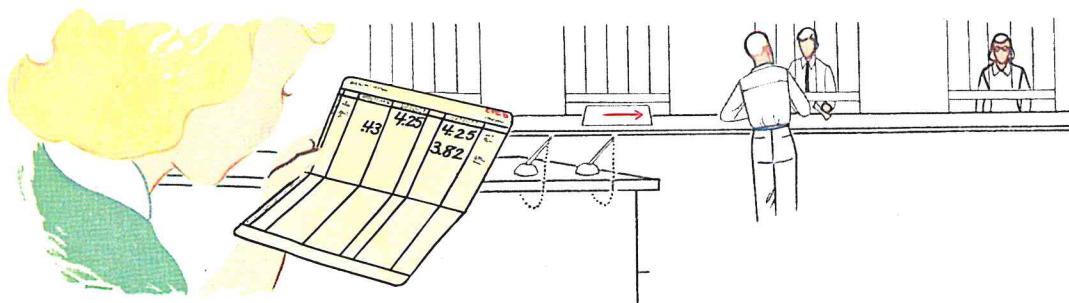
Read each story problem. Pay special attention to the question. If sets are to be thought of as being put together, you are to add the numbers of the sets. If sets are to be taken apart, or if you are to find out by how many the number of one set differs from that of another, subtract the numbers of the sets.

Oral Be ready to tell whether you add or subtract to solve the following problems. Tell why you decided as you did.

1. A case of eggs at the hatchery held 144 eggs. The man threw away 26 cracked eggs. How many eggs did he have left? **Subtract; a set is taken apart**
 $144 - 26 = \square$ 118 eggs
2. One of the larger incubators held 628 eggs. All except 79 of the eggs hatched. How many eggs hatched?
Subtract; a set is taken apart $628 - 79 = \square$ 549 eggs
3. Paul counted 132 eggs in one of the incubators. Of these, 29 were white eggs and the rest were brown. How many of the eggs were brown? **Subtract; a set is taken apart** $132 - 29 = \square$ 103 eggs
4. The man at the hatchery said the small incubator held 324 eggs. One tray, which had room for 36 eggs, was empty, but the other trays were full. How many eggs were in the incubator? **Subtract; a set is taken apart**
 $324 - 36 = \square$ 288 eggs

Written Solve problems 1 through 4 above. Check your work carefully. **See above.**

Can you do this? Make up and write 3 story problems about something you have seen or done outside of school. Make up problems that can be solved using subtraction.



Subtracting Numbers That Stand for Money

You can subtract \$.43 from \$4.25 if you think of the numbers as standing for dollars, dimes, and cents. Then the subtraction can be done as shown below.

	\$4.25		³ 4 ¹ dollars	→ 2 dimes	5 cents		³ 4 ¹² 25	\$4.25
A	<u>-.43</u>	B	<u>—</u>	4 dimes	3 cents	C	<u>-.43</u>	D <u>-.43</u>
			3 dollars	8 dimes	2 cents		\$3.82	\$3.82

Why couldn't you subtract 4 dimes from 2 dimes? What was done to make it possible to subtract the numbers that stood for dimes? In C do you see that the signs \$ and . are kept in straight columns?

Oral How would you subtract \$.65 from \$4.38? \$.29 from \$6.57? \$.75 from \$8.25? *See diagram above.*

Written Copy. Write each difference. Check.

	<i>a</i>	<i>b</i>	<i>c</i>	<i>d</i>	<i>e</i>	<i>f</i>
1.	$\begin{array}{r} 325 \\ -57 \\ \hline 268 \end{array}$	$\begin{array}{r} 495 \\ -79 \\ \hline 416 \end{array}$	$\begin{array}{r} 160 \\ -45 \\ \hline 115 \end{array}$	$\begin{array}{r} 500 \\ -98 \\ \hline 402 \end{array}$	$\begin{array}{r} \$2.75 \\ -.25 \\ \hline \$2.50 \end{array}$	$\begin{array}{r} \$5.50 \\ -.10 \\ \hline \$5.40 \end{array}$
2.	$\begin{array}{r} 232 \\ -76 \\ \hline 156 \end{array}$	$\begin{array}{r} 105 \\ -15 \\ \hline 90 \end{array}$	$\begin{array}{r} 300 \\ -25 \\ \hline 275 \end{array}$	$\begin{array}{r} 153 \\ -25 \\ \hline 128 \end{array}$	$\begin{array}{r} \$3.58 \\ -.60 \\ \hline \$2.98 \end{array}$	$\begin{array}{r} \$6.98 \\ -.85 \\ \hline \$6.13 \end{array}$

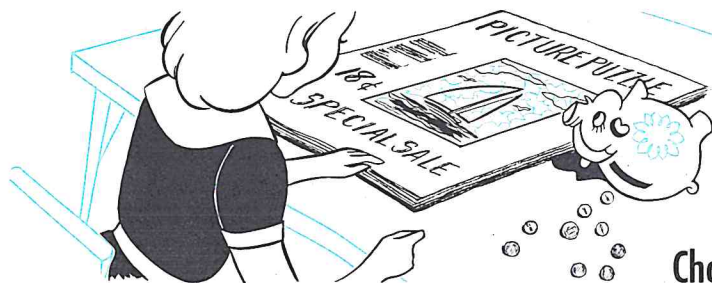
Using Addition or Subtraction to Solve Problems

Read each story problem. Pay special attention to the question. If sets are to be thought of as being put together, you are to add the numbers of the sets. If sets are to be taken apart, or if you are to find out by how many the number of one set differs from that of another, subtract the numbers of the sets.

Oral Be ready to tell whether you add or subtract to solve the following problems. Tell how you decided.

1. Ann and her mother went shopping. They bought Ann a dress for \$3.29, and handkerchiefs for \$.75. How much did they spend altogether? **Add; sets are joined** $329+75=\square$ \$4.04
2. Mark earned \$4.49 shoveling snow. He spent \$.98 for a cowboy hat. How much money did he have left? **Subtract; a set is taken apart** $449-98=\square$ \$3.51
3. Patty wants a pair of gloves that cost \$1.95. She has saved \$.85. How much more money does she need to buy the gloves? **Subtract; sets are compared** $195-85=\square$ \$1.10
4. Sue received \$1.75 for taking care of the Allens' canary while they were away. Sue spent \$.36 on bird seed. How much money did she have left? **Subtract; a set is taken apart** $175-36=\square$ \$1.39
5. Tim earned \$1.25. Bill earned \$.98. How much money did the boys earn altogether? **Add; sets are joined** $125+98=\square$ \$2.23
6. Jack's father bought Jack a pair of shoes for \$6.49 and a shirt for \$2.19. How much money did he spend? **Add; sets are joined** $649+219=\square$ \$8.68
7. Terry earned \$1.65. If he bought a boat for \$.89, how much money would he have left? **Subtract; a set is taken apart** $165-89=\square$ \$.76

Written Solve problems 1 through 7 above. **See above.**



Choosing Sensible Answers

You will find it easy to solve story problems when you know what number would be sensible, or *about right*, for an answer. Read the problem below. Tell which of the three answers given sounds sensible.

Myra has 49¢. If she spends 18¢, how much money will she have left? (70¢, 10¢, 30¢)

You know that 49¢ is *about* 50¢. You also know that 18¢ is *about* 20¢. How much is 50-20? Would 30 be a sensible answer? Would Myra have *about* 30¢?

Oral Read each problem. Decide upon an arithmetic statement to use in solving each problem. Be ready to tell the statement you plan to use. Then tell which answer seems sensible and why you chose it.

1. Jane lives 9 blocks from school. After she has walked 5 blocks toward school, how many blocks will she have to walk to reach the school? (10, 4, 15) $9-5=\square$
4 blocks
2. Jack is 11 years old. How old will he be in 5 more years? (6, 16, 26) $11+5=\square$ 16 years
3. One morning Peter met 3 boys. A block further along the way the boys met 5 other boys. How many boys in all were in the group? (2, 9, 15) $1+3+5=\square$
9 boys
4. Susan is 45 inches tall. When she grows 6 inches, how tall will she be? (21, 101, 51) $45+6=\square$ 51 inches

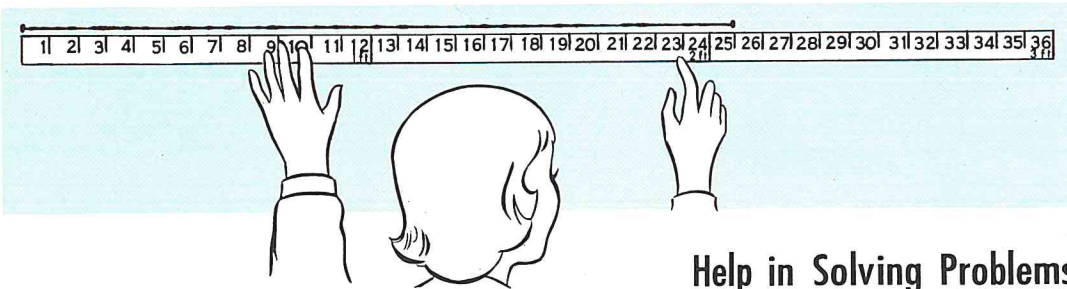


5. There are 18 boys and 16 girls in our class. How many children is that? (25, 34, 40) $18+16=\square$
34 children
6. If a blouse costs \$3.95 and a skirt costs \$6.98, how much would both cost? (\$3.00, \$10.00, \$15.00)
 $395+698=\square$ \$10.93
7. Ted has saved \$2.27. If he spends 98¢, how much money will he have left? (\$1.00, \$1.25, 75¢)
 $227-98=\square$ \$1.29
8. Harriet has read 98 pages. There are 225 pages in the book she is reading. How many pages has she yet to read? (125, 225, 200) $225-98=\square$ 127 pages
9. Max has 41 United States stamps and 18 German stamps. How many stamps has he in all? (30, 60, 80)
 $41+18=\square$ 59 stamps

Written Write an arithmetic statement for problems 1 through 9. Find the missing number in each statement and write the answer. See above.

Can you do this? Read each problem below. Try to solve the problem without doing any writing. Be ready to tell your answer and how you solved each problem.

1. Mike promised to sell 25 tickets for the school fair. He has sold all but 9. How many tickets has he sold?
 $25-9=\square$ 16 tickets
2. Molly used \$1.00 to pay for groceries that cost 50¢. How much change should she receive? $100-50=\square$
50¢
3. Sally is 9 years old. Her brother Joe is 15 years old. How much younger is Sally than Joe? $15-9=\square$ 6 years



Help in Solving Problems

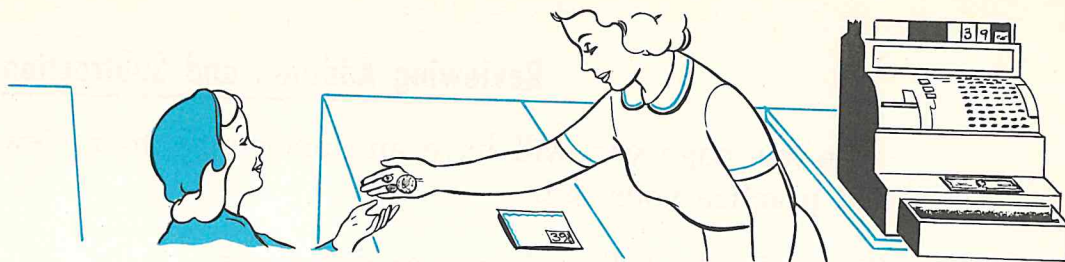
Before you can decide whether to add or subtract in solving a problem, you should think about the story and the question asked about it.

If the question means:	Then you are to:
how many there are altogether	join the sets, or add the numbers of the sets.
how many are left	separate a set into parts, or subtract the numbers of the sets.
how many are gone	
how many more	compare the sets to find by how many they differ, or subtract the numbers of the sets.
how many fewer	
how many more are needed	

It will help you solve a problem if you learn to decide upon a sensible answer before you solve the problem. This is called *estimating answers*.

Oral Read each of these problems. Estimate the answer. Be ready to tell the arithmetic statement you used when you made your estimate. Tell how you made each estimate.

1. How many inches longer is a 36-inch yardstick than a piece of string 25 inches long? $36-25=\square$ 11 inches



2. Sue used \$1.00 to pay for a 39¢ handkerchief. What change did she get? $100-39=\square$ 61¢
3. Arthur paid \$.95 for a bird book and \$1.49 for a stamp book. How much did both books cost him?
 $95+149=\square$ \$2.44
4. Jack is 43 inches tall. His father is 72 inches tall. How much taller than Jack is his father? $72-43=\square$
29 inches
5. Mark is 9 years old. His father is 31 years old. What is the difference between their ages? $31-9=\square$ 22 years
6. Phyllis bought a stamp book that holds 500 stamps. She has saved 195 stamps. How many more stamps does she need to fill the book? $500-195=\square$ 305 stamps
7. Sam has saved \$1.16. He wants to buy a book that costs \$2.00. How much more money does he need?
 $200-116=\square$ 84¢
8. Ray brought 29 cookies to a party. Tom brought 22. How many cookies did the two boys bring? $29+22=\square$
51 cookies

Written Solve problems 1 through 8. See above.

A quick review

	<i>a</i>	<i>b</i>	<i>c</i>	<i>d</i>	<i>e</i>	<i>f</i>
1.	$\begin{array}{r} 96 \\ -58 \\ \hline 38 \end{array}$	$\begin{array}{r} 63 \\ -20 \\ \hline 43 \end{array}$	$\begin{array}{r} 70 \\ -57 \\ \hline 13 \end{array}$	$\begin{array}{r} 304 \\ -28 \\ \hline 276 \end{array}$	$\begin{array}{r} 200 \\ -35 \\ \hline 165 \end{array}$	$\begin{array}{r} 138 \\ -40 \\ \hline 98 \end{array}$
2.	$\begin{array}{r} 324 \\ +200 \\ \hline 524 \end{array}$	$\begin{array}{r} 327 \\ +135 \\ \hline 462 \end{array}$	$\begin{array}{r} 975 \\ +546 \\ \hline 1521 \end{array}$	$\begin{array}{r} 452 \\ +273 \\ \hline 725 \end{array}$	$\begin{array}{r} 706 \\ +322 \\ \hline 1028 \end{array}$	$\begin{array}{r} 503 \\ +216 \\ \hline 719 \end{array}$
					195	

Because the procedure in using this page parallels that used on pages T136-T137, no page T196 is included.

Reviewing Addition and Subtraction

On this page you will have an opportunity to review and practice your skills.

Oral Read. Tell each sum or difference.

<i>a</i>	<i>b</i>	<i>c</i>
1. $565 + 57 = \square$ 622	$654 - 32 = \square$ 622	$416 + 38 = \square$ 454
2. $386 + 43 = \square$ 429	$472 - 58 = \square$ 414	$216 - 85 = \square$ 131
3. $206 - 21 = \square$ 185	$175 + 25 = \square$ 200	$160 - 34 = \square$ 126

Written Copy. Write each sum or difference.

	<i>a</i>	<i>b</i>	<i>c</i>	<i>d</i>	<i>e</i>	<i>f</i>
1.	$\begin{array}{r} 329 \\ -12 \\ \hline 317 \end{array}$	$\begin{array}{r} 372 \\ -25 \\ \hline 347 \end{array}$	$\begin{array}{r} 197 \\ +346 \\ \hline 543 \end{array}$	$\begin{array}{r} 526 \\ -43 \\ \hline 483 \end{array}$	$\begin{array}{r} 283 \\ +151 \\ \hline 434 \end{array}$	$\begin{array}{r} 465 \\ +127 \\ \hline 592 \end{array}$
2.	$\begin{array}{r} 500 \\ -18 \\ \hline 482 \end{array}$	$\begin{array}{r} 179 \\ -6 \\ \hline 173 \end{array}$	$\begin{array}{r} 384 \\ -7 \\ \hline 377 \end{array}$	$\begin{array}{r} 206 \\ -54 \\ \hline 152 \end{array}$	$\begin{array}{r} 370 \\ -9 \\ \hline 361 \end{array}$	$\begin{array}{r} 400 \\ -98 \\ \hline 302 \end{array}$
3.	$\begin{array}{r} \$2.88 \\ +1.82 \\ \hline \$4.70 \end{array}$	$\begin{array}{r} \$4.00 \\ -3.98 \\ \hline \$.02 \end{array}$	$\begin{array}{r} \$1.79 \\ -.85 \\ \hline \$.94 \end{array}$	$\begin{array}{r} \$2.90 \\ -.06 \\ \hline \$2.84 \end{array}$	$\begin{array}{r} \$3.11 \\ +.79 \\ \hline \$3.90 \end{array}$	$\begin{array}{r} \$5.99 \\ +.75 \\ \hline \$6.74 \end{array}$
4.	$\begin{array}{r} 17 \\ 326 \\ +22 \\ \hline 365 \end{array}$	$\begin{array}{r} 805 \\ 97 \\ +70 \\ \hline 972 \end{array}$	$\begin{array}{r} 302 \\ 21 \\ +33 \\ \hline 356 \end{array}$	$\begin{array}{r} 97 \\ 88 \\ +96 \\ \hline 281 \end{array}$	$\begin{array}{r} 75 \\ 47 \\ +112 \\ \hline 234 \end{array}$	$\begin{array}{r} 57 \\ 162 \\ +30 \\ \hline 249 \end{array}$
5.	$\begin{array}{r} 500 \\ 123 \\ +316 \\ \hline 939 \end{array}$	$\begin{array}{r} 375 \\ 187 \\ +254 \\ \hline 816 \end{array}$	$\begin{array}{r} 331 \\ 212 \\ +126 \\ \hline 669 \end{array}$	$\begin{array}{r} 506 \\ 103 \\ +205 \\ \hline 814 \end{array}$	$\begin{array}{r} 461 \\ 273 \\ +150 \\ \hline 884 \end{array}$	$\begin{array}{r} 127 \\ 206 \\ +345 \\ \hline 678 \end{array}$
6.	$\begin{array}{r} 729 \\ 365 \\ 211 \\ +175 \\ \hline 1480 \end{array}$	$\begin{array}{r} 9076 \\ 89 \\ 167 \\ +459 \\ \hline 9791 \end{array}$	$\begin{array}{r} 201 \\ 7000 \\ 876 \\ +59 \\ \hline 8136 \end{array}$	$\begin{array}{r} 2440 \\ 2861 \\ 773 \\ +3005 \\ \hline 9079 \end{array}$	$\begin{array}{r} 1276 \\ 2189 \\ 3145 \\ +1265 \\ \hline 7875 \end{array}$	$\begin{array}{r} 1756 \\ 2638 \\ 1496 \\ +3762 \\ \hline 9652 \end{array}$

Because the procedure in using this page parallels that of previous pages of *Checkup Time* (see T181 or T161), no page T197 is included.

Checkup Time

The numerals in () tell the pages where you can turn for help if you need it.

Important Ideas

1. You can change the form of hundreds in subtraction in the same way you change the form of tens. (185)

2. When there is a 0 in the tens place in the minuend, you have to change the form of 1 hundred to 10 tens before you can change the form of 1 ten to 10 ones. (187)

3. You can subtract dollars and cents in the same way you subtract hundreds, tens, and ones. (190)

Questions to Discuss

See below.

1. What steps would you take to find the difference in this subtraction? (183)

$$\begin{array}{r} 278 \\ -36 \\ \hline \end{array}$$

2. What steps would you need to take to find the difference in the subtraction at the right? (184)

$$\begin{array}{r} 452 \\ -26 \\ \hline \end{array}$$

3. How would you find the difference in the subtraction at the right? (185)

$$\begin{array}{r} 628 \\ -43 \\ \hline \end{array}$$

4. How would you find the difference in the subtraction at the right? (186)

$$\begin{array}{r} 324 \\ -86 \\ \hline \end{array}$$

5. How would you find the difference in the subtraction at the right? (187)

$$\begin{array}{r} 703 \\ -78 \\ \hline \end{array}$$

Oral Practice

Read. Be ready to tell how to solve each problem. Tell what statement you would use. (194)

1. There are 435 children in the Byrd School. 62 of them are in the third grade. How many are in all the other grades?

$$435 - 62 = \square \quad 373 \text{ children}$$

2. Two farmers bought some baby chickens. One bought 130 chickens. The other farmer bought 65 chickens. How many more chickens did one farmer buy than the other? $130 - 65 = \square$

65 chickens

1. Subtract ones; subtract tens; write hundreds
2. Rename 452 as 4 hundreds, 4 tens, 12 ones; subtract
3. Rename 628 as 5 hundreds, 12 tens, 8 ones; subtract
4. Rename 324 as 2 hundreds, 11 tens, 14 ones; subtract
5. Rename 703 as 6 hundreds, 9 tens, 13 ones; subtract

Self-Evaluation

Part 1 Copy. Write each sum.

a	b
1. $24 + 38 = \square$ 62	$136 + 57 = \square$ 193
2. $548 + 237 = \square$ 785	$946 + 217 = \square$ 1163
3. $805 + 237 = \square$ 1042	$730 + 271 = \square$ 1001
4. $106 + 907 = \square$ 1013	$576 + 847 = \square$ 1423

Part 2 Copy. Write each difference. Check.

a	b	c
1. $\begin{array}{r} 87 \\ -36 \\ \hline 51 \end{array}$	$\begin{array}{r} 79 \\ -23 \\ \hline 56 \end{array}$	$\begin{array}{r} 54 \\ -16 \\ \hline 38 \end{array}$
2. $\begin{array}{r} 273 \\ -32 \\ \hline 241 \end{array}$	$\begin{array}{r} 535 \\ -16 \\ \hline 519 \end{array}$	$\begin{array}{r} 578 \\ -92 \\ \hline 486 \end{array}$
3. $\begin{array}{r} 436 \\ -78 \\ \hline 358 \end{array}$	$\begin{array}{r} 724 \\ -28 \\ \hline 696 \end{array}$	$\begin{array}{r} 306 \\ -47 \\ \hline 259 \end{array}$
4. $\begin{array}{r} \$7.00 \\ - .36 \\ \hline \$6.64 \end{array}$	$\begin{array}{r} \$6.32 \\ - .39 \\ \hline \$5.93 \end{array}$	$\begin{array}{r} \$7.05 \\ - .58 \\ \hline \$6.47 \end{array}$

Part 3 Write the abbreviation for each of these words.

a	b
1. pound lb.	ounce oz.
2. foot ft.	yard yd.
3. quart qt.	gallon gal.

Part 4 Decide on a sensible answer for each problem below. Then write an arithmetic statement for the problem and solve it. Check your work.

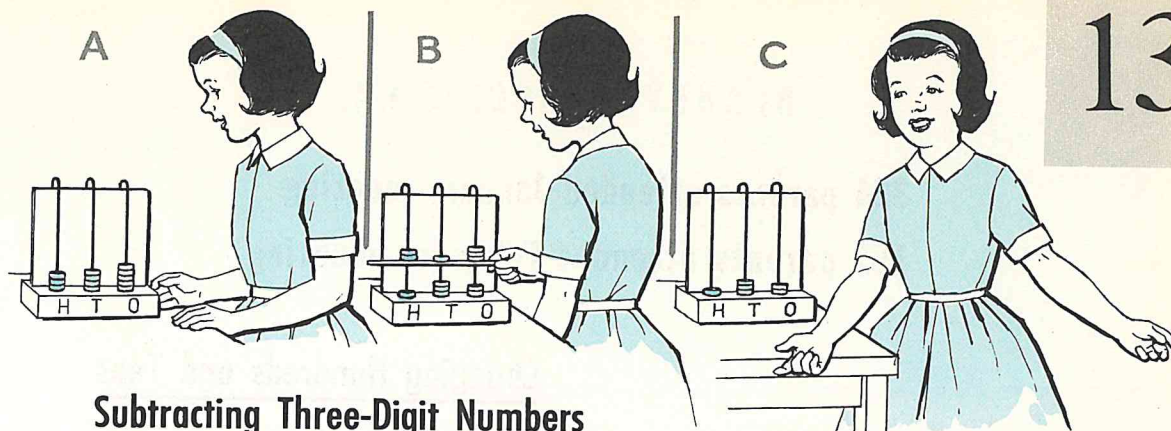
1. Joe is reading a book of 256 pages. He has read 34 pages. How many more pages has he yet to read? 256-34=□ 222 pages

2. The first grade ordered 38 bottles of milk. The second grade ordered 30 bottles, and the third grade ordered 29. How many bottles were ordered? 38+30+29=□ 97 bottles

3. Jim has collected 158 stamps. Of these, 40 are American stamps. How many are from other lands? 158-40=□ 118 stamps

Part 5 Copy. Write each sum. Check.

a	b	c
1. $\begin{array}{r} 264 \\ 48 \\ 320 \\ +95 \\ \hline 727 \end{array}$	$\begin{array}{r} 456 \\ 572 \\ 34 \\ +768 \\ \hline 1830 \end{array}$	$\begin{array}{r} 130 \\ 283 \\ 101 \\ +374 \\ \hline 888 \end{array}$
2. $\begin{array}{r} 641 \\ 350 \\ 473 \\ +582 \\ \hline 2046 \end{array}$	$\begin{array}{r} 318 \\ 106 \\ 245 \\ +209 \\ \hline 878 \end{array}$	$\begin{array}{r} 423 \\ 879 \\ 504 \\ +267 \\ \hline 2073 \end{array}$



Subtracting Three-Digit Numbers

Janet is showing how you might use a counting frame to find the difference between 345 and 213. How did she use counters to show 345 in A? What did she do in B? In C? How many counters in C are left on the ones rod? On the tens rod? On the hundreds rod? What is the difference between 213 and 345?

You can subtract 213 from 345 as shown below.

345	3 hundreds	4 tens	5 ones	H T O	345
<u>-213</u>	<u>-2 hundreds</u>	<u>1 ten</u>	<u>3 ones</u>	<u>-213</u>	<u>-213</u>
	1 hundred	3 tens	2 ones	1 3 2	132

Do you subtract hundreds as you subtract ones? As you subtract tens?

Oral Read. Tell how to find each difference below.

See diagram above.

	a	b	c	d	e	f
1.	728 <u>-616</u> 112	895 <u>-432</u> 463	643 <u>-331</u> 312	575 <u>-412</u> 163	695 <u>-344</u> 351	471 <u>-250</u> 221
2.	471 <u>-261</u> 210	836 <u>-122</u> 714	982 <u>-431</u> 551	524 <u>-304</u> 220	793 <u>-653</u> 140	615 <u>-504</u> 111
						199

BLANEY SCHOOL P.T.A.

324 parents attended January meeting

152 parents attended February meeting

Changing Hundreds and Tens

To find the difference between 324 and 152, you can subtract the numbers. The statement can be written as $324 - 152 = \square$, or in column form on a grid as shown at the right.

You can subtract the ones. Why? Can you subtract 5 tens from 2 tens? Why not? What can you do to have more tens?

You can think of 3 hundreds as 2 hundreds + 1 hundred. Then the form of 1 hundred can be changed to 10 tens and added to the tens as shown. Now can you subtract the ones? The tens? The hundreds?

The difference between 152 and 324 is 1 hundred, 7 tens, and 2 ones, or 172.

Oral Answer each question below.

1. What must you do before you can subtract the ones in A? *Change tens to ones*
2. What must you do before you can subtract the ones in B? The tens in B?
Change tens to ones; hundreds to tens
3. What must you do before you can subtract the ones in C? The tens in C?
Change tens to ones; hundreds to tens

H	T	O
3	2	4
-	1	5
2		

H	T	O
2	12	4
-	1	5
2		
1	7	2

A

5	3	1
-	2	2
9		

B

7	2	3
-	4	8
5		

C

8	1	0
-	2	3
9		

Practicing Subtraction

You should be able to do this page by yourself.

Written Copy. Write each difference. Check.

	<i>a</i>	<i>b</i>	<i>c</i>	<i>d</i>	<i>e</i>	<i>f</i>
1.	$\begin{array}{r} 637 \\ -166 \\ \hline 471 \end{array}$	$\begin{array}{r} 879 \\ -390 \\ \hline 489 \end{array}$	$\begin{array}{r} 924 \\ -594 \\ \hline 330 \end{array}$	$\begin{array}{r} 615 \\ -484 \\ \hline 131 \end{array}$	$\begin{array}{r} 634 \\ -590 \\ \hline 44 \end{array}$	$\begin{array}{r} 325 \\ -234 \\ \hline 91 \end{array}$
2.	$\begin{array}{r} 987 \\ -639 \\ \hline 348 \end{array}$	$\begin{array}{r} 780 \\ -516 \\ \hline 264 \end{array}$	$\begin{array}{r} 855 \\ -747 \\ \hline 108 \end{array}$	$\begin{array}{r} 652 \\ -618 \\ \hline 34 \end{array}$	$\begin{array}{r} 743 \\ -227 \\ \hline 516 \end{array}$	$\begin{array}{r} 972 \\ -365 \\ \hline 607 \end{array}$
3.	$\begin{array}{r} 968 \\ -671 \\ \hline 297 \end{array}$	$\begin{array}{r} 323 \\ -175 \\ \hline 148 \end{array}$	$\begin{array}{r} 446 \\ -189 \\ \hline 257 \end{array}$	$\begin{array}{r} 615 \\ -484 \\ \hline 131 \end{array}$	$\begin{array}{r} 846 \\ -567 \\ \hline 279 \end{array}$	$\begin{array}{r} 780 \\ -516 \\ \hline 264 \end{array}$
4.	$\begin{array}{r} 433 \\ -289 \\ \hline 144 \end{array}$	$\begin{array}{r} 652 \\ -418 \\ \hline 234 \end{array}$	$\begin{array}{r} 870 \\ -390 \\ \hline 480 \end{array}$	$\begin{array}{r} 743 \\ -227 \\ \hline 516 \end{array}$	$\begin{array}{r} 370 \\ -274 \\ \hline 96 \end{array}$	$\begin{array}{r} 972 \\ -365 \\ \hline 607 \end{array}$
5.	$\begin{array}{r} 924 \\ -357 \\ \hline 567 \end{array}$	$\begin{array}{r} 446 \\ -189 \\ \hline 257 \end{array}$	$\begin{array}{r} 846 \\ -567 \\ \hline 279 \end{array}$	$\begin{array}{r} 433 \\ -389 \\ \hline 44 \end{array}$	$\begin{array}{r} 694 \\ -196 \\ \hline 498 \end{array}$	$\begin{array}{r} 323 \\ -175 \\ \hline 148 \end{array}$

Write an arithmetic statement for each problem below.
Solve each problem.

- Dick had a collection of 212 bottle caps. Roger had a collection of 165. How many more bottle caps were in Dick's collection than in Roger's? $212-165=\square$
47 bottle caps
- There were 990 pupils in a school. One stormy day 117 were absent. How many pupils were present?
 $990-117=\square$ 873 pupils
- Jack had a coin collection of 215 coins. Of these, 129 were pennies and the rest were other coins. How many coins were not pennies? $215-129=\square$ 86 coins
- Sarah planted 325 small tomato plants. 162 of the plants did not live. How many plants lived?
 $325-162=\square$ 163 plants

Changing the Form of Hundreds and Tens

If you are to find by how many 307 is greater than 119, you subtract the numbers. The arithmetic statement is $307 - 119 = \square$. Can you subtract 9 ones from 7 ones? Why not? Can you subtract 1 ten from 0 tens? Why not? What can you do to have more tens?

The picture below shows how to subtract 119 from 307. What is the difference?

$\begin{array}{r} 307 \\ -119 \\ \hline \end{array}$	$\begin{array}{rcl} 2 + \textcircled{1} & \xrightarrow{\quad} & 9 + \textcircled{1} \\ 3 \text{ hundreds} & \rightarrow 10 \text{ tens} & \rightarrow 17 \text{ ones} \\ 1 \text{ hundred} & 1 \text{ ten} & 9 \text{ ones} \\ \hline 1 \text{ hundred} & 8 \text{ tens} & 8 \text{ ones} \end{array}$	<table style="display: inline-table; border-collapse: collapse;"> <tr> <td style="border-right: 1px solid black; padding: 0 5px; text-align: center;">H</td> <td style="border-right: 1px solid black; padding: 0 5px; text-align: center;">T</td> <td style="padding: 0 5px; text-align: center;">O</td> </tr> <tr> <td style="border-right: 1px solid black; padding: 0 5px; text-align: center;">2</td> <td style="border-right: 1px solid black; padding: 0 5px; text-align: center;">9</td> <td style="padding: 0 5px; text-align: center;">17</td> </tr> <tr> <td style="border-right: 1px solid black; padding: 0 5px; text-align: center;">3</td> <td style="border-right: 1px solid black; padding: 0 5px; text-align: center;">0</td> <td style="padding: 0 5px; text-align: center;">7</td> </tr> <tr> <td style="border-right: 1px solid black; padding: 0 5px; text-align: center;">-1</td> <td style="border-right: 1px solid black; padding: 0 5px; text-align: center;">1</td> <td style="padding: 0 5px; text-align: center;">9</td> </tr> <tr> <td style="border-right: 1px solid black; padding: 0 5px; text-align: center;">1</td> <td style="border-right: 1px solid black; padding: 0 5px; text-align: center;">8</td> <td style="padding: 0 5px; text-align: center;">8</td> </tr> </table> <div style="display: inline-block; vertical-align: bottom; margin-left: 20px;"> $\begin{array}{r} 307 \\ -119 \\ \hline 188 \end{array}$ </div>	H	T	O	2	9	17	3	0	7	-1	1	9	1	8	8
H	T	O															
2	9	17															
3	0	7															
-1	1	9															
1	8	8															

Oral Tell what changes in form were made in each subtraction below. Tell why they were needed. See diagram above.

a

H	T	O
7	9	17
8	0	7
-3	2	8
4	7	9

b

H	T	O
8	9	10
9	0	0
-6	1	7
2	8	3

c

H	T	O
6	9	15
7	0	5
-3	4	8
3	5	7

MORE PRACTICE
 PAGE 312

Written Copy in column form. Find each difference. Check by adding the subtrahend to the difference.

a

1. $304 - 135 = \square$ 169
2. $705 - 427 = \square$ 278
3. $601 - 342 = \square$ 259

b

- $803 - 325 = \square$ 478
- $500 - 281 = \square$ 219
- $502 - 373 = \square$ 129

c

- $406 - 23 = \square$ 383
- $607 - 498 = \square$ 109
- $708 - 519 = \square$ 189

You should be able to do this page by yourself. Check each addition and subtraction as shown.

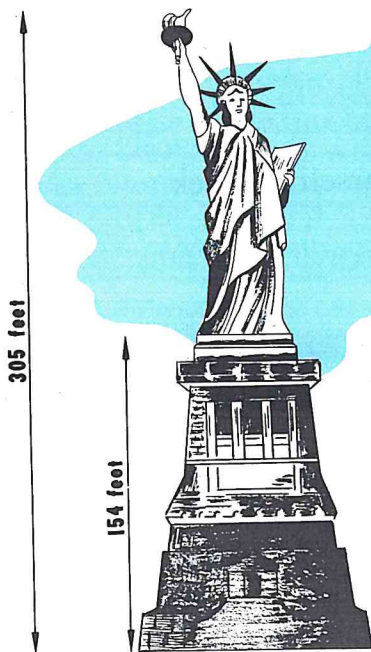
or $(3 + 4) + 5 = \square$

or $(5 + 4) + 3 = \square$

$$\begin{array}{r} 419 \\ -192 \\ \hline 227 \\ +192 \\ \hline 419 \end{array}$$

	<i>a</i>	<i>b</i>	<i>c</i>
1.	$407 - 309 = \square$ ⁹⁸	$300 + 295 = \square$ ⁵⁹⁵	$703 - 368 = \square$ ³³⁵
2.	$900 - 456 = \square$ ⁴⁴⁴	$802 + 548 = \square$ ¹³⁵⁰	$904 - 175 = \square$ ⁷²⁹
3.	$460 - 29 = \square$ ⁴³¹	$187 + 38 = \square$ ²²⁵	$887 - 78 = \square$ ⁸⁰⁹

	<i>a</i>	<i>b</i>	<i>c</i>	<i>d</i>	<i>e</i>	<i>f</i>
1.	$\begin{array}{r} 416 \\ -238 \\ \hline 178 \end{array}$	$\begin{array}{r} 979 \\ -224 \\ \hline 755 \end{array}$	$\begin{array}{r} 694 \\ -281 \\ \hline 413 \end{array}$	$\begin{array}{r} \$6.29 \\ -4.12 \\ \hline \$2.17 \end{array}$	$\begin{array}{r} 36 \\ +48 \\ \hline 84 \end{array}$	$\begin{array}{r} 42 \\ +36 \\ \hline 78 \end{array}$
2.	$\begin{array}{r} 854 \\ -692 \\ \hline 162 \end{array}$	$\begin{array}{r} 605 \\ -417 \\ \hline 188 \end{array}$	$\begin{array}{r} 315 \\ -172 \\ \hline 143 \end{array}$	$\begin{array}{r} \$.98 \\ +.09 \\ \hline \$1.07 \end{array}$	$\begin{array}{r} 231 \\ +24 \\ \hline 255 \end{array}$	$\begin{array}{r} 197 \\ +32 \\ \hline 229 \end{array}$
3.	$\begin{array}{r} 126 \\ 772 \\ +131 \\ \hline 1029 \end{array}$	$\begin{array}{r} 47 \\ 537 \\ +216 \\ \hline 800 \end{array}$	$\begin{array}{r} 131 \\ 77 \\ +692 \\ \hline 900 \end{array}$	$\begin{array}{r} \$1.00 \\ 5.67 \\ +2.14 \\ \hline \$8.81 \end{array}$	$\begin{array}{r} 406 \\ 300 \\ +165 \\ \hline 871 \end{array}$	$\begin{array}{r} 342 \\ 315 \\ +170 \\ \hline 827 \end{array}$
4.	$\begin{array}{r} 468 \\ -289 \\ \hline 179 \end{array}$	$\begin{array}{r} 579 \\ -247 \\ \hline 332 \end{array}$	$\begin{array}{r} 873 \\ -868 \\ \hline 5 \end{array}$	$\begin{array}{r} \$5.00 \\ -3.17 \\ \hline \$1.83 \end{array}$	$\begin{array}{r} 398 \\ -274 \\ \hline 124 \end{array}$	$\begin{array}{r} 503 \\ -497 \\ \hline 6 \end{array}$



Should You Add or Subtract?

Read each story problem. Pay special attention to the question. If sets are to be thought of as being put together, you are to add the numbers of the sets. If sets are to be taken apart, or if you are to find out by how many the number of one set differs from that of another, subtract the numbers of the sets.

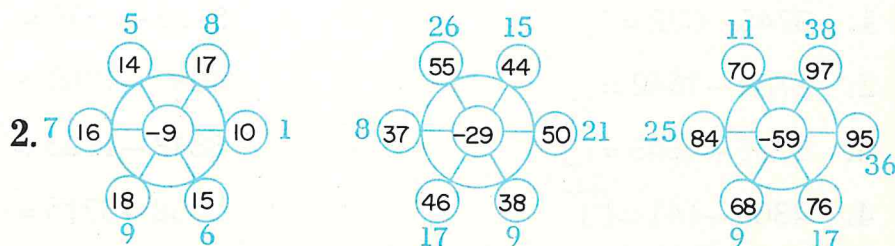
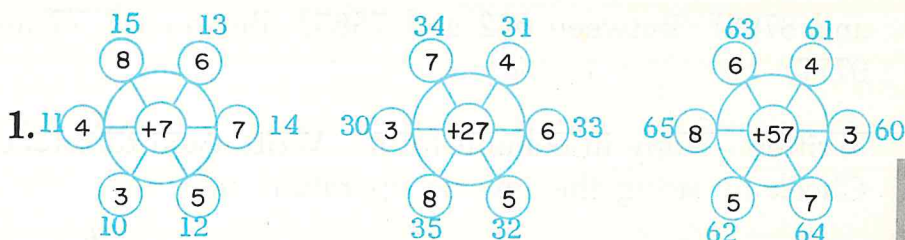
Oral Tell whether you would add or subtract to solve problems 1 through 10. Tell why you decided as you did.

1. What is the height of the Statue of Liberty shown on this page? Subtract; sets are compared $305 - 154 = \square$
151 feet
2. The Empire State Building has a height of 1250 feet and has a 222 foot television tower on top of it. What is the distance from the ground to the top of the television tower? Add; sets are joined $1250 + 222 = \square$
1472 feet
3. The United States opened the Panama Canal in 1914. How old was the canal in 1963? Subtract; sets are compared $1963 - 1914 = \square$ 49 years old
4. James and his father were on a 500 mile trip. They had traveled 297 miles when their car broke down. How much farther did they have to travel? Subtract; sets are compared $500 - 297 = \square$ 203 miles
5. On a business trip, Mary's father traveled 1500 miles by plane and 185 miles by car. How far did he travel while on the trip? Add; sets are joined $1500 + 185 = \square$
1685 miles

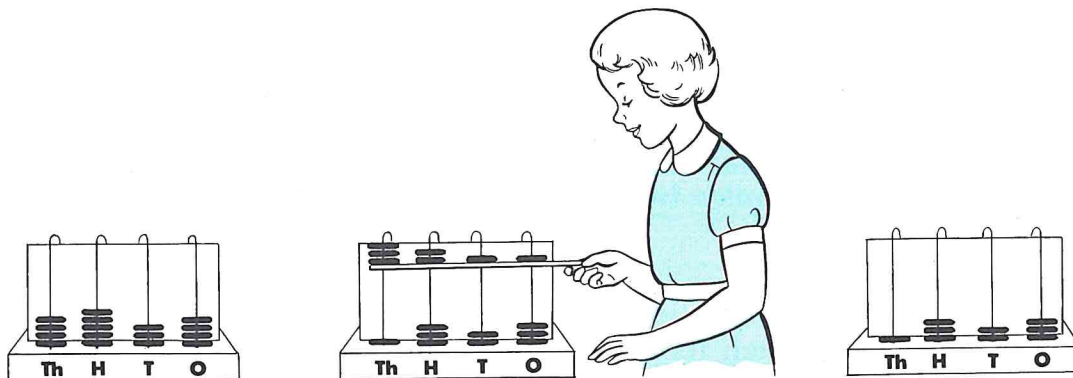
6. George has saved \$1.75 to buy a shirt that costs \$2.20. How much more must he save? Subtract; sets are compared $220-175=\square$ \$.45
7. Joe rode 525 miles by airplane, 296 miles by train, and 105 miles by car. How far did he ride? Add; sets are joined $525+296+105=\square$ 926 miles
8. If you had \$5.00 and bought a pair of skates for \$3.95, how much money would you still have? Subtract; a set is taken apart $500-395=\square$ \$1.05
9. A pair of shoes for Alice costs \$3.87. A pair for Tom costs \$4.98. What will both pairs cost? Add; sets are joined $387+498=\square$ \$8.85
10. A game that had cost \$1.25 is now priced at \$.89. How much more did it cost at the old price? Subtract; sets are compared $125-89=\square$ \$.36

Written Write an arithmetic statement for each problem on pages 204 and 205. Solve each one. See above.

Can you do this? In row 1, write the sum of the number in the center of each wheel when it is added to each number on the edge of the wheel. In row 2, write the difference between the number in the center and each number on the edge of the wheel.



MORE PRACTICE
PAGE 313



Subtracting Three-Digit or Four-Digit Numbers

Sally is showing how you might find the difference between 4534 and 3211 by using a counting frame. Can the counters on the thousands rod be used in the same way as those on the hundreds rod?

The subtraction can also be done on a grid as shown. Do you subtract thousands as you subtract ones? As you subtract hundreds?

Th	H	T	O	
4	5	3	4	4534
-3	2	1	1	-3211
1	3	2	3	1323

Oral How would you find the difference between 4357 and 8798? Between 642 and 7865? Between 7777 and 9777? See example above.

Written Copy in column form. Write each difference. Check by using the inverse operation, addition.

MORE PRACTICE
 PAGE 314

- a* 9113
1. $9745 - 632 = \square$
 2. $3784 - 1642 = \square$ 2142
 3. $8765 - 4643 = \square$ 4122
 4. $4362 - 141 = \square$ 4221

- b* 3113
- $5429 - 2316 = \square$
 - $4683 - 1250 = \square$ 3433
 - $3848 - 1626 = \square$ 2222
 - $5638 - 3315 = \square$ 2323

Changing the Form of Thousands to Hundreds

Can you find the missing number for the statement $4134 - 2321 = \square$? You can subtract the ones and the tens without making changes in form. Can you subtract 3 hundreds from 1 hundred? What can you do to have more hundreds?

Look at the grid at the right. What changes in form were made in order to subtract the hundreds? What is the difference between 2321 and 4134? Can you change thousands to hundreds in the same way you change hundreds to tens?

Th	H	T	O
4	1	3	4
-2	3	2	1
<hr/>			
1	8	1	3

4134
-2321
<hr/>
1813

Oral Be ready to explain each subtraction below.

Change thousands to hundreds

<i>a</i>	<i>b</i>	<i>c</i>	<i>d</i>
9438	7697	8397	6027
-621	-742	-4751	-5217
<hr/>	<hr/>	<hr/>	<hr/>
8817	6955	3646	810

Written Copy. Write each difference. Check.

	<i>a</i>	<i>b</i>	<i>c</i>	<i>d</i>	<i>e</i>	<i>f</i>
1.	4310	6610	4379	5761	7563	6437
	-400	-800	-562	-811	-652	-714
	<hr/>	<hr/>	<hr/>	<hr/>	<hr/>	<hr/>
	3910	5810	3817	4950	6911	5723
2.	3789	8281	9642	8682	8586	4287
	-850	-361	-832	-871	-643	-526
	<hr/>	<hr/>	<hr/>	<hr/>	<hr/>	<hr/>
	2939	7920	8810	7811	7943	3761
3.	6427	9358	6872	5294	3614	2108
	-1506	-3526	-2950	-2863	-2801	-1904
	<hr/>	<hr/>	<hr/>	<hr/>	<hr/>	<hr/>
	4921	5832	3922	2431	813	204
4.	5320	8496	3647	9496	3518	9175
	-1610	-2835	-1821	-8603	-2813	-6342
	<hr/>	<hr/>	<hr/>	<hr/>	<hr/>	<hr/>
	3710	5661	1826	893	705	2833

Practicing Subtraction

You should be able to do this page by yourself. Be sure to make each change in form that is needed.

Written Copy in column form. Write each difference. Check by using the inverse operation, addition.

- | a | b | c |
|---|--|--|
| 1. $6687 - 597 = \square$ 6090 | $3989 - 897 = \square$ 3092 | $4256 - 176 = \square$ 4080 |
| 2. $8214 - 4172 = \square$ 4042 | $7762 - 3672 = \square$ 4090 | $5865 - 5574 = \square$ 291 |
| 3. $5538 - 775 = \square$ 4763 | $4219 - 928 = \square$ 3291 | $3142 - 970 = \square$ 2172 |
| 4. $8727 - 4976 = \square$ 3751 | $9347 - 2876 = \square$ 6471 | $8125 - 3452 = \square$ 4673 |
| 5. $4266 - 1287 = \square$ 2979 | $4764 - 775 = \square$ 3989 | $8275 - 289 = \square$ 7986 |
| 6. $9941 - 962 = \square$ 8979 | $9826 - 4875 = \square$ 4951 | $6462 - 3475 = \square$ 2987 |

Solve each problem.

- Mary went shopping and spent \$7.79. She gave the clerk \$10.00. How much change should she get?
1000-779= \$2.21
- Muriel can buy a sweater for \$8.65 or a dress for \$11.25. How much more would she have to pay for the dress than for the sweater? 1125-865= \$2.60

Can you do this? Some of the numerals in the subtractions below have been replaced by 's. See if you can discover and write the correct numeral in place of each .

$$\begin{array}{r} a \\ 4 \text{ } \text{ } 7 \text{ } 6 \\ - 3 \text{ } 4 \text{ } \text{ } \\ \hline 4 \text{ } 2 \text{ } \text{ } 4 \end{array}$$

$$\begin{array}{r} b \\ 8 \text{ } 2 \text{ } \text{ } 5 \\ - 4 \text{ } 0 \text{ } \text{ } \\ \hline 7 \text{ } \text{ } 0 \text{ } 9 \end{array}$$

$$\begin{array}{r} c \\ 3 \text{ } \text{ } 0 \text{ } 2 \\ - 7 \text{ } 4 \text{ } \text{ } \\ \hline \text{ } 3 \text{ } 5 \text{ } 8 \end{array}$$

Estimating Answers

In each of the problems below, you are given a choice of three possible answers. One of the answers is closer to the correct answer than the others. Find the answer that is most nearly correct.

Oral Read each problem carefully. Decide which of the answers is about right. Write the answer you chose and tell how and why you chose the answer you decided upon.

1. One sweater sells for \$5.49 and another sells for \$3.98. How much more does the first one cost than the second one costs? (\$.50, \$1.50, \$2.50) $549-398=\square$
\$1.51
2. Jerry had 80 papers to sell. Now he has 27 left. How many papers has he already sold? (30, 40, 50)
 $80-27=\square$ 53 papers
3. There are 132 pupils in Joan's school. 27 are absent today. How many are present? (30, 50, 100)
 $132-27=\square$ 105 pupils
4. Patty's mother had \$9.00 in her purse. She spent \$4.75 at the grocery store. How much money did she have left? (\$.50, \$4.20, \$6.30) $900-475=\square$ \$4.25
5. Sally's father drove to a city 686 miles away. The first day he drove 489 miles. How much farther did he have to drive? (100, 200, 300) $686-489=\square$ 197 miles
6. The sale price of a radio was \$12.90. The regular price was \$15.50. How much could you save at the sale? (\$2.60, \$3.90, \$4.10) $1550-1290=\square$ \$2.60

Written Solve problems 1 through 6 above to see if you were right. See above.

Because the procedure in using this page parallels that used on pages T207 and T202, no page T210 is included.

Changing the Form of Thousands, Hundreds, and Tens

Look at the arithmetic statement $4065 - 1778 = \square$. It can be written in column form as in A. Can you subtract 8 ones from 5 ones? Why not? What can you do to have more ones? Can you subtract 7 tens from 6 tens? 7 hundreds from 0 hundreds?

In B, you see what to do before you can subtract. What is the difference between 1778 and 4065?

	Th	H	T	O
A	4	0	6	5
	-1	7	7	8

B

Th	H	T	O
9	15		
3	10	8	15
4	0	6	5
-1	7	7	8
2	2	8	7

Oral Be ready to tell the steps you would use in finding each difference. Tell how you decided. See examples above.

$$\begin{array}{r} a \\ 9057 - 3648 = \square \end{array} \quad \begin{array}{r} b \\ 7004 - 3973 = \square \end{array} \quad \begin{array}{r} c \\ 5100 - 2816 = \square \end{array}$$

Written Copy. Write each difference. Check.

	a	b	c	d	e	f
1.	$\begin{array}{r} 5265 \\ -2318 \\ \hline 2947 \end{array}$	$\begin{array}{r} 6690 \\ -2882 \\ \hline 3808 \end{array}$	$\begin{array}{r} 2792 \\ -1963 \\ \hline 829 \end{array}$	$\begin{array}{r} 7654 \\ -1738 \\ \hline 5916 \end{array}$	$\begin{array}{r} 8647 \\ -3539 \\ \hline 5108 \end{array}$	$\begin{array}{r} 4395 \\ -2476 \\ \hline 1919 \end{array}$
2.	$\begin{array}{r} 7755 \\ -2366 \\ \hline 5389 \end{array}$	$\begin{array}{r} 9941 \\ -6765 \\ \hline 3176 \end{array}$	$\begin{array}{r} 8227 \\ -4149 \\ \hline 4078 \end{array}$	$\begin{array}{r} 7642 \\ -2365 \\ \hline 5277 \end{array}$	$\begin{array}{r} 8742 \\ -4657 \\ \hline 4085 \end{array}$	$\begin{array}{r} 9842 \\ -2388 \\ \hline 7454 \end{array}$
3.	$\begin{array}{r} 2007 \\ -1558 \\ \hline 449 \end{array}$	$\begin{array}{r} 8006 \\ -2321 \\ \hline 5685 \end{array}$	$\begin{array}{r} 5004 \\ -4113 \\ \hline 891 \end{array}$	$\begin{array}{r} 9003 \\ -7352 \\ \hline 1651 \end{array}$	$\begin{array}{r} 6009 \\ -3556 \\ \hline 2453 \end{array}$	$\begin{array}{r} 6582 \\ -2445 \\ \hline 4137 \end{array}$
4.	$\begin{array}{r} 6374 \\ -4267 \\ \hline 2107 \end{array}$	$\begin{array}{r} 7252 \\ -3145 \\ \hline 4107 \end{array}$	$\begin{array}{r} 4456 \\ -1337 \\ \hline 3119 \end{array}$	$\begin{array}{r} 9493 \\ -3267 \\ \hline 6226 \end{array}$	$\begin{array}{r} 8297 \\ -2178 \\ \hline 6119 \end{array}$	$\begin{array}{r} 2468 \\ -1249 \\ \hline 1219 \end{array}$

Because the procedure in using this page parallels that of previous pages of *Checkup Time* (see T181 or T161), no page T211 is included.

Checkup Time

The numerals in () tell the pages where you can turn for help if you need it.

Important Ideas

1. You can subtract hundreds in the same way you subtract ones and tens. (199)

2. Change the form of 1 hundred to 10 tens as you change the form of 1 ten to 10 ones. (200)

3. In subtraction, if the tens digit in the minuend is a zero, you change the form of 1 hundred to 10 tens before you can change a ten to 10 ones. (202)

4. You can change thousands to hundreds in the same way you change hundreds to tens. (207)

Questions to Discuss

See below.

1. What changes in form were necessary to subtract as at the right? (202)

$$\begin{array}{r} 802 \\ -628 \\ \hline 174 \end{array}$$

2. What changes in form were necessary to subtract as at the right? (207, 210)

$$\begin{array}{r} 3026 \\ -1579 \\ \hline 1447 \end{array}$$

Oral Practice

Read each problem carefully. Tell which answer you think is correct and why. (209)

1. Philip brought 37 cupcakes to class. 23 pupils each ate one. How many cakes were left over? (60, 17, 14)

2. At the store, Marcella bought a doll dress for \$1.98 and a doll's wardrobe trunk for \$4.50. How much more was the trunk than the dress? (\$3.47, \$2.52, \$1.67)

Written Practice

Copy. Write each difference. Check. (199, 202, 207)

	<i>a</i>	<i>b</i>	<i>c</i>
1.	$\begin{array}{r} 476 \\ -203 \\ \hline 273 \end{array}$	$\begin{array}{r} 832 \\ -476 \\ \hline 356 \end{array}$	$\begin{array}{r} 747 \\ -238 \\ \hline 509 \end{array}$
2.	$\begin{array}{r} 503 \\ -267 \\ \hline 236 \end{array}$	$\begin{array}{r} 4387 \\ -626 \\ \hline 3761 \end{array}$	$\begin{array}{r} 5103 \\ -2579 \\ \hline 2524 \end{array}$
3.	$\begin{array}{r} 400 \\ -296 \\ \hline 104 \end{array}$	$\begin{array}{r} 8462 \\ -798 \\ \hline 7664 \end{array}$	$\begin{array}{r} 7467 \\ -3879 \\ \hline 3588 \\ 211 \end{array}$

1. Change 802 to 7 hundreds, 9 tens, 12 ones

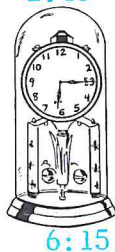
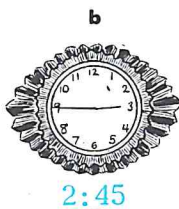
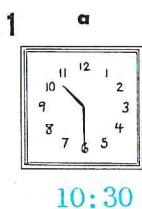
2. Change 3026 to 2 thousands, 9 hundreds, 11 tens, 16 ones

Self-Evaluation

Part 1 Copy. Write each sum or difference. Check.

<i>a</i>	<i>b</i>	<i>c</i>
1. $\begin{array}{r} 235 \\ +439 \\ \hline 674 \end{array}$	$\begin{array}{r} 463 \\ +71 \\ \hline 534 \end{array}$	$\begin{array}{r} 399 \\ +8 \\ \hline 407 \end{array}$
2. $\begin{array}{r} 45 \\ 57 \\ +58 \\ \hline 160 \end{array}$	$\begin{array}{r} 375 \\ 84 \\ +435 \\ \hline 894 \end{array}$	$\begin{array}{r} 512 \\ 111 \\ +190 \\ \hline 813 \end{array}$
3. $\begin{array}{r} 376 \\ 389 \\ +297 \\ \hline 1062 \end{array}$	$\begin{array}{r} 297 \\ 57 \\ +8 \\ \hline 362 \end{array}$	$\begin{array}{r} 302 \\ 204 \\ +403 \\ \hline 909 \end{array}$
4. $\begin{array}{r} 296 \\ -87 \\ \hline 209 \end{array}$	$\begin{array}{r} 406 \\ -75 \\ \hline 331 \end{array}$	$\begin{array}{r} 615 \\ -540 \\ \hline 75 \end{array}$
5. $\begin{array}{r} 524 \\ -312 \\ \hline 212 \end{array}$	$\begin{array}{r} 6807 \\ -2818 \\ \hline 3989 \end{array}$	$\begin{array}{r} 3402 \\ -1426 \\ \hline 1976 \end{array}$

Part 2 Write the numeral that tells the time shown on each of these clocks.



Part 3 Write each of these problems in the language of arithmetic and solve it.

1. Mr. Atherton grew 3108 bushels of field corn in one year. He needed 1810 bushels to feed his cows and hogs through the winter. How many bushels would he have left over? $3108 - 1810 = \square$
1298 bushels

2. A plane trip from Portland to Chicago is 1741 miles. From Chicago to Miami the trip is 1190 miles. How many miles is it from Portland to Miami by way of Chicago? $1741 + 1190 = \square$ 2931 miles

3. 1223 people attended a basketball game. 346 people had free tickets. How many people paid for their seats? $1223 - 346 = \square$
877 people

4. 6003 people live in Brookdale now. Ten years ago only 2473 people lived in Brookdale. How much did the population grow in ten years? $6003 - 2473 = \square$
3530 people

5. A truck loaded with oranges weighed 9476 pounds. The empty truck weighed 6587 pounds. How much did the oranges weigh? $9476 - 6587 = \square$
2889 pounds



Groups with the Same Number

Jane has arranged the cups in groups, or sets. How many cups are in each group? Does each group of cups have the same number? The cups are in groups of the same size because there are the same number of cups in each group. What things besides cups has Jane arranged in groups of the same size?

Two or more groups that contain the same number of objects are called **groups of equal size** or **equivalent sets**. A group of 4 cups and a group of 4 plates are called *groups of equal size* or *equivalent sets* because they contain the same number of objects, 4.

Oral The X's in some rows stand for groups of equal size. In some rows they do not. In each of the rows containing groups of equal size, tell how many X's are in the row. Then tell how many X's are in each group.

a

1. XXX XXX 6; 3

2. XXXX XXX

3. XX XX XX XX 8; 2

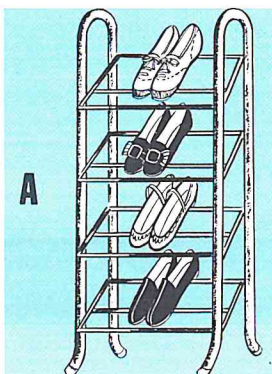
b

XXXX XXXX XX

XXX XXX XXX 9; 3

XXXX XXXX XXXX 12; 4

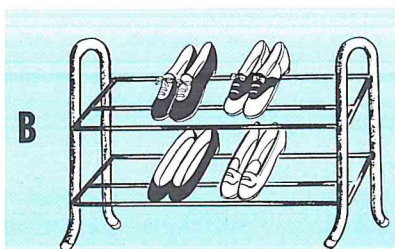
Adding the Same Number Repeatedly



Is the same number of shoes in each group of shoes on the rack in A? How many pairs of shoes are there?

You can think of the shoes as being arranged in groups of 2. You can find the total number of all the shoes by thinking of the groups of equal size as being put together or by repeatedly adding 2 as follows. $2+2+2+2=8$. Four 2's when added are how many?

Now look at the shoes in B. Are there 2 groups of 4 shoes? How many shoes are in both groups together?



To find how many shoes in all, add the two 4's. Two 4's when added equal how many?

The sum of four 2's is the same as the sum of two 4's, but two 4's are different from four 2's. Explain how.

Oral Read. Replace each \square with a number word.

Numerals only are given.

- a*
1. $2+2+2=\square$
 2. $3+3=\square$
 3. $3+3+3=\square$
 4. $2+2=\square$
 5. $2+2+2+2=\square$
 6. $4+4=\square$

- b*
- Three 2's (added) = \square
- Two 3's (added) = \square
- Three 3's (added) = \square
- Two 2's (added) = \square
- Four 2's (added) = \square
- Two 4's (added) = \square

Using Multiplication

Betty has 4 pairs of socks. There are 2 socks in each pair. How many socks does she have?

Think of the pairs of socks as being put together. The arithmetic statement is $2+2+2+2=\square$.

A fast way to add the same number repeatedly is to **multiply**. You could use the **multiplication** statement $4\times 2=\square$. It is read: "Four times 2 equals how many?" To answer the question, *think*: "Four 2's equal 8." Betty has 8 socks.

In column form, the multiplication statement is written as shown. What sign tells you to multiply?

$$\begin{array}{r} 2 \text{ (the number of socks in each group)} \\ \times 4 \text{ (the number of groups)} \\ \hline 8 \text{ (the number of socks altogether)} \end{array}$$

Oral Tell how to change each addition statement to a multiplication statement. Tell how to change each multiplication statement to an addition statement. See paragraphs above.

- a*
- $3+3+3+3=\square$ ¹²
 - $4+4+4+4=\square$ ¹⁶
 - $5+5+5+5=\square$ ²⁰
 - $3+3+3=\square$ ⁹

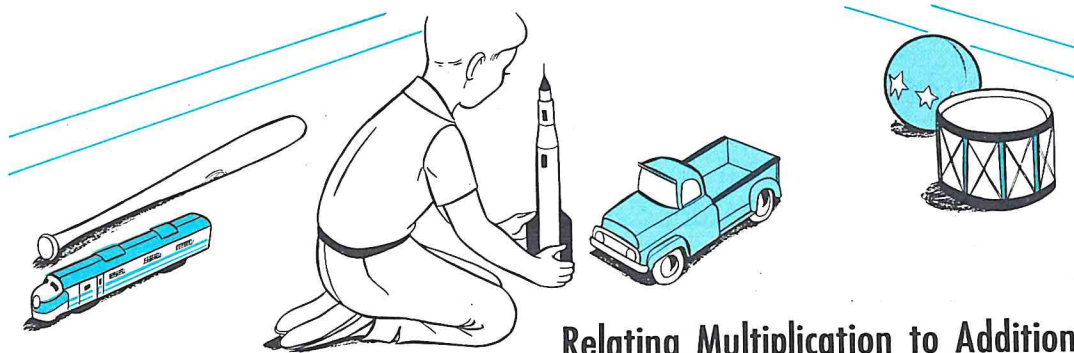
- b*
- $4\times 3=\square$ ¹²
 - $4\times 4=\square$ ¹⁶
 - $4\times 5=\square$ ²⁰
 - $3\times 3=\square$ ⁹

Written Copy rows 1 through 4 above. Replace each \square with the missing numeral. See above.

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Relating Multiplication to Addition

Look at the matching addition and multiplication statements below.

$$\begin{array}{c} \times \\ \times \end{array}$$

$$\begin{array}{c} \times \\ \times \end{array}$$

$$\begin{array}{c} \times \\ \times \end{array}$$

$$2 + 2 + 2 = 6$$

$$3 \times 2 = 6$$

What is the sum of 2 and 2 and 2? Do you see that three 2's (added) equal 6? Does $3 \times 2 = 6$?

The number you find when you multiply is called the **product**. The product of 3 times 2 is 6. Which number is the product in each of these multiplication statements: $2 \times 2 = 4$, $3 \times 3 = 9$, $4 \times 1 = 4$, $4 \times 0 = 0$, $0 \times 4 = 0$, $5 \times 0 = 0$?

Oral Tell the sum and then the product in each matching addition and multiplication statement below.

a 8

1. $2 + 2 + 2 + 2 = \square$
 $4 \times 2 = \square$ 8

b 4

$2 + 2 = \square$
 $2 \times 2 = \square$ 4

c 6

$3 + 3 = \square$
 $2 \times 3 = \square$ 6

12

2. $3 + 3 + 3 + 3 = \square$
 $4 \times 3 = \square$ 12

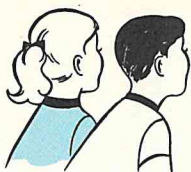
8

$4 + 4 = \square$
 $2 \times 4 = \square$ 8

10

$5 + 5 = \square$
 $2 \times 5 = \square$ 10

Written Copy the arithmetic statements above. Write each sum or product. See above.



The Language of Multiplication

5 groups of children with 2 children in each group are needed for a new game. How many children are needed?

To answer the question, you are to think of groups of 2 as being joined. You could repeatedly add the number 2. $2+2+2+2+2=\square$. Are there five 2's to add? Since the groups all have the same number, you could save time by multiplying like this: $5 \times 2 = \square$.

Does 5 tell how many groups of equal size are to be joined? 5 is called the **multiplier**. It is the number by which you multiply. Does 2 tell how many in each group?

2 is called the **multiplicand**. It is the number you multiply. Either the multiplier or the multiplicand may also be called a **factor**.

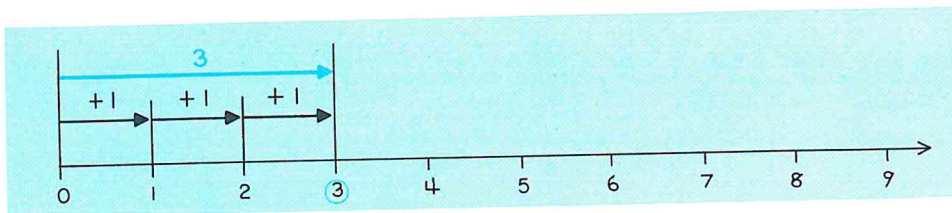
2	multiplicand
$\times 5$	multiplier
10	product

Oral Tell which word, *multiplicand*, *multiplier*, or *product*, belongs in each () below. See example above.

a	b	c	d	e	f
$\begin{array}{r} 3 \\ \times 2 \\ \hline 6 \end{array}$	$\begin{array}{r} 2 \\ \times 2 \\ \hline 4 \end{array}$	$\begin{array}{r} 2 \\ \times 3 \\ \hline 6 \end{array}$	$\begin{array}{r} 4 \\ \times 2 \\ \hline 8 \end{array}$	$\begin{array}{r} 2 \\ \times 4 \\ \hline 8 \end{array}$	$\begin{array}{r} 3 \\ \times 3 \\ \hline 9 \end{array}$

Written Copy. Replace each \square with the correct numeral.

a	b	c	d
1. $4 \times 2 = \square$	$2 \times 4 = \square$	$4 \times 3 = \square$	$3 \times 4 = \square$
2. $2 \times 3 = \square$	$3 \times 2 = \square$	$3 \times 3 = \square$	$2 \times 2 = \square$



Using a Multiplier of 1

Look at the short arrows that reach from 0 to 1, 1 to 2, and 2 to 3 on the number line above. Do you see that $1+1+1=3$? Does $3 \times 1 = 3$? Now look at the long arrow that reaches from 0 to 3. Does one 3 equal 3? Does $1 \times 3 = 3$? Since $3 \times 1 = 3$ and $1 \times 3 = 3$ then $3 \times 1 = 1 \times 3$. The property that two numbers may be multiplied in either order to give the same product is called the *commutative property of multiplication*.

Can you also see that 1 times any given number does not change the number? Because of this property, one is called the *identity number of multiplication*.

Oral Read. Replace each \square with a number word.

Numerals only are given.

- | <i>a</i> | <i>b</i> | <i>c</i> | <i>d</i> |
|---------------------------|------------------------|------------------------|------------------------|
| 1. $1 \times 4 = \square$ | $\square \times 1 = 1$ | $\square \times 6 = 6$ | $1 \times 3 = \square$ |
| 2. $\square \times 5 = 5$ | $1 \times \square = 1$ | $1 \times \square = 1$ | $\square \times 8 = 8$ |
| 3. $1 \times \square = 2$ | $1 \times \square = 6$ | $1 \times 8 = \square$ | $1 \times \square = 5$ |
| 4. $\square \times 2 = 2$ | $\square \times 9 = 9$ | $1 \times \square = 7$ | $\square \times 3 = 3$ |
| 5. $1 \times 2 = \square$ | $\square \times 4 = 4$ | $1 \times \square = 4$ | $\square \times 7 = 7$ |
| 6. $1 \times \square = 3$ | $1 \times \square = 8$ | $1 \times 5 = \square$ | $1 \times \square = 9$ |
| 7. $1 \times 9 = \square$ | $1 \times 6 = \square$ | $1 \times \square = 9$ | $1 \times 7 = \square$ |

Written Copy rows 1 through 7 above. Replace each \square with the correct numeral. *See above.*

Using a Multiplicand of 1

Look at the picture below. Notice what happens when you begin with 1 and add more 1's, one at a time.

$$\begin{array}{r} 1 \\ +1 \\ \hline 2 \end{array} \quad \begin{array}{r} 1 \\ \times 2 \\ \hline 2 \end{array}$$

$$2 \times 1 = 2$$

$$\begin{array}{r} 1 \\ +1 \\ \hline 3 \end{array} \quad \begin{array}{r} 1 \\ \times 3 \\ \hline 3 \end{array}$$

$$3 \times 1 = 3$$

$$\begin{array}{r} 1 \\ +1 \\ \hline 4 \end{array} \quad \begin{array}{r} 1 \\ \times 4 \\ \hline 4 \end{array}$$

$$4 \times 1 = 4$$

$$\begin{array}{r} 1 \\ +1 \\ \hline 5 \end{array} \quad \begin{array}{r} 1 \\ \times 5 \\ \hline 5 \end{array}$$

$$5 \times 1 = 5$$

Do you see that two 1's (added) equal 2? Three 1's equal 3? Four 1's equal 4? Five 1's equal 5?

Read each of these statements: $6 \times 1 = 6$, $7 \times 1 = 7$, $8 \times 1 = 8$, and $9 \times 1 = 9$. Does multiplying one by any given number change the given number?

Oral Answer these questions. See also T219.

1. Which number is the multiplier in each multiplication in the tint block? Which number is the product?
2. $2, 3, 4, 5; 2, 3, 4, 5$ When you multiply 1 by a number, is that number the product? Does $1 \times 1 = 1$? Yes; yes

Written Copy. Replace each \square with a numeral.

$$1. \quad \begin{array}{c} a \\ 2 \times 1 = \square \end{array}$$

$$\begin{array}{c} b \\ \square \times 1 = 4 \end{array}$$

$$\begin{array}{c} c \\ 6 \times 1 = \square \end{array}$$

$$\begin{array}{c} d \\ 3 \times \square = 3 \end{array}$$

$$2. \quad 5 \times \square = 5$$

$$\square \times 1 = 3$$

$$4 \times \square = 4$$

$$8 \times 1 = \square$$

$$3. \quad \square \times 1 = 2$$

$$7 \times \square = 7$$

$$8 \times \square = 8$$

$$6 \times \square = 6$$

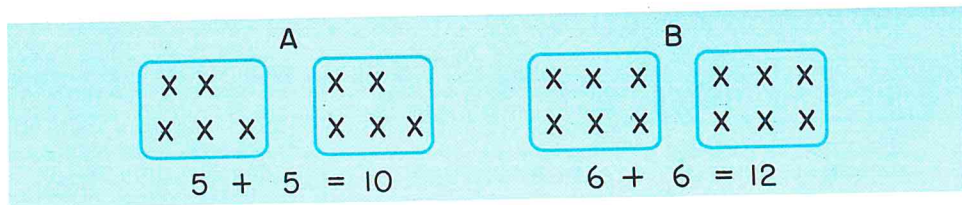
$$4. \quad \square \times 1 = 5$$

$$5 \times \square = \square$$

$$2 \times \square = 2$$

$$\square \times 8 = 8$$

MORE PRACTICE
PAGE 315



Using a Multiplier of 2

How many 5's are added in A above? What is the sum?
 How many 6's are added in B? What is the sum? What
 is the sum of two 7's? Of two 8's? Of two 9's?

You used repeated addition to find each sum above.
 Could you have used multiplication? Why?

Read each statement below.

$2 \times 1 = 2$

$2 \times 4 = 8$

$2 \times 7 = 14$

$2 \times 2 = 4$

$2 \times 5 = 10$

$2 \times 8 = 16$

$2 \times 3 = 6$

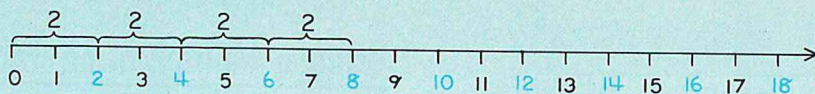
$2 \times 6 = 12$

$2 \times 9 = 18$

Oral Tell how to use set drawings or addition to prove
 that each of the above multiplications is correct. See
 examples A and B above; see also T220.

Written Copy. Replace each \square with a numeral.

- | | | | |
|--|-------------------------------|--------------------------------|--------------------------------|
| a
$1. \quad 2 \times 5 = \square$ | b
$2 \times 7 = \square$ | c
$\square \times 6 = 12$ | d
$2 \times \square = 14$ |
| $2. \quad \square \times 7 = 14$ | $2 \times 2 = \square$ | $\square \times 9 = 18$ | $2 \times 3 = \square$ |
| $3. \quad 2 \times \square = 4$ | $\square \times 5 = 10$ | $\square \times 2 = 4$ | $\square \times 1 = 2$ |
| $4. \quad 2 \times 6 = \square$ | $2 \times \square = 16$ | $\square \times 3 = 6$ | $\square \times 4 = 8$ |
| $5. \quad 2 \times \square = 2$ | $2 \times \square = 6$ | $2 \times \square = 18$ | $2 \times \square = 8$ |
| $6. \quad \square \times 8 = 16$ | $\square \times 4 = 8$ | $2 \times \square = 10$ | $2 \times \square = 12$ |



Using a Multiplicand of 2

The number line above can help you discover the products when the multiplicand is 2. Do you see the four 2's shown above the number line? Does $2+2+2+2=8$? Do four 2's (added) equal 8? Does $4 \times 2 = 8$?

Use the number line to see if each multiplication below is correct.

$$1 \times 2 = 2$$

$$4 \times 2 = 8$$

$$7 \times 2 = 14$$

$$2 \times 2 = 4$$

$$5 \times 2 = 10$$

$$8 \times 2 = 16$$

$$3 \times 2 = 6$$

$$6 \times 2 = 12$$

$$9 \times 2 = 18$$

Oral Read. Supply each product.

$\begin{array}{r} a \\ 2 \\ \times 1 \\ \hline 2 \end{array}$	$\begin{array}{r} b \\ 2 \\ \times 6 \\ \hline 12 \end{array}$	$\begin{array}{r} c \\ 2 \\ \times 9 \\ \hline 18 \end{array}$	$\begin{array}{r} d \\ 2 \\ \times 7 \\ \hline 14 \end{array}$	$\begin{array}{r} e \\ 2 \\ \times 3 \\ \hline 6 \end{array}$	$\begin{array}{r} f \\ 2 \\ \times 4 \\ \hline 8 \end{array}$	$\begin{array}{r} g \\ 2 \\ \times 2 \\ \hline 4 \end{array}$	$\begin{array}{r} h \\ 2 \\ \times 8 \\ \hline 16 \end{array}$	$\begin{array}{r} i \\ 2 \\ \times 5 \\ \hline 10 \end{array}$
---	--	--	--	---	---	---	--	--

Written Copy. Replace each \square with a numeral.

- | | | | |
|---|--|---|--|
| $\begin{array}{r} a \\ 12 \\ 1. \end{array} 6 \times 2 = \square$ | $\begin{array}{r} b \\ 2 \\ 1. \end{array} 1 \times 2 = \square$ | $\begin{array}{r} c \\ 6 \\ 1. \end{array} \square \times 2 = 12$ | $\begin{array}{r} d \\ 2 \\ 1. \end{array} 3 \times \square = 6$ |
| $\begin{array}{r} 6 \\ 2. \end{array} 3 \times 2 = \square$ | $\begin{array}{r} 18 \\ 2. \end{array} 9 \times 2 = \square$ | $\begin{array}{r} 2 \\ 2. \end{array} 7 \times \square = 14$ | $\begin{array}{r} 1 \\ 2. \end{array} 2 \times \square = 2$ |
| $\begin{array}{r} 14 \\ 3. \end{array} 7 \times 2 = \square$ | $\begin{array}{r} 8 \\ 3. \end{array} 4 \times 2 = \square$ | $\begin{array}{r} 2 \\ 3. \end{array} 9 \times \square = 18$ | $\begin{array}{r} 2 \\ 3. \end{array} 1 \times \square = 2$ |
| $\begin{array}{r} 1 \\ 4. \end{array} \square \times 2 = 2$ | $\begin{array}{r} 3 \\ 4. \end{array} \square \times 2 = 6$ | $\begin{array}{r} 2 \\ 4. \end{array} 4 \times \square = 8$ | $\begin{array}{r} 8 \\ 4. \end{array} 2 \times \square = 16$ |
| $\begin{array}{r} 9 \\ 5. \end{array} \square \times 2 = 18$ | $\begin{array}{r} 2 \\ 5. \end{array} 6 \times \square = 12$ | $\begin{array}{r} 2 \\ 5. \end{array} \square \times 7 = 14$ | $\begin{array}{r} 2 \\ 5. \end{array} \square \times 4 = 8$ |

×	1	2	3	4	5	6	7	8	9
1	1	2	3	4	5	6	7	8	9
2	2	4	6	8	10	12	14	16	18
3	3	6	9	12	15	18	21	24	27
4	4	8	12	16	20	24	28	32	36
5	5	10	15	20	25	30	35	40	45
6	6	12	18	24	30	36	42	48	54
7	7	14	21	28	35	42	49	56	63
8	8	16	24	32	40	48	56	64	72
9	9	18	27	36	45	54	63	72	81

Multiplication Table

Using a Multiplication Table

A multiplication table is easy to make and use. Study the table on this page. Which numerals are across the top row? Which numerals are down the front column? Which numerals follow the 1 of the front column? Which numerals follow the 2? The 3? The 4? The 5?

The strips help you see how to find the product of 2 and 5. How would you use the table to find the product when you multiply 8 by 2? 9 by 2? 2 by 6?

You can use the table to find the missing numeral in $2 \times \square = 12$. Find the 2 in the top row. Follow the column down until you find the product, 12. Then find the numeral in the front column in the same row as the 12. Does $2 \times 6 = 12$?

Oral Answer these questions. See T222 for answers.

- How would you use the table to find the missing number in $2 \times \square = 18$? In $\square \times 2 = 18$?
- How is the multiplication table like the addition table? How is it different?

Written Copy. Replace each \square with a numeral.

- | | | | |
|---------------------------|------------------------|------------------------|------------------------|
| a | b | c | d |
| 1. $2 \times 1 = \square$ | $2 \times 4 = \square$ | $2 \times 8 = \square$ | $2 \times 9 = \square$ |
| 2. $2 \times 7 = \square$ | $2 \times 6 = \square$ | $2 \times 5 = \square$ | $2 \times 3 = \square$ |

Using Multiplication in Solving Problems

John has 8 pages in his photograph album to fill with pictures. He plans to put 2 pictures on each page. How many pictures does he need?

You are to think of 8 groups of 2 as being put together. Because the groups being put together are groups of equal size, you multiply rather than add. The arithmetic statement is $8 \times 2 = \square$.

It may be written in column form as above.

2	pictures per page
<u>$\times 8$</u>	number of pages
16	number of pictures John needs

In $8 \times 2 = \square$ the product is 16. John needs 16 pictures. Does 16 seem like a reasonable answer?

Oral Read each problem below. Tell how you would change it into an arithmetic statement. Tell why you decided as you did. *Sets of equal size are joined.*

1. Peter had 9 friends. He gave 2 cookies to each. How many cookies did he give away? $9 \times 2 = \square$ 18 cookies
2. If 2 children sit at each table in the lunch room, how many children sit at 8 tables? $8 \times 2 = \square$ 16 children
3. If Mary puts 2 pieces of chalk at each chalkboard, how many pieces will she need for 4 chalkboards?
 $2 \times 4 = \square$ 8 pieces
4. Amy saw 6 cages at the cat show. There were 2 cats in each cage. How many cats did Amy see? $6 \times 2 = \square$
12 cats
5. What is the cost of 2 stamps that cost 4¢ each?
 $2 \times 4 = \square$ 8¢

Written Solve each problem above. *See above.*

Problems for Review

Read each problem carefully and decide how to solve it. Add the numbers if you can answer the question by putting together groups unequal in size. Subtract the numbers if you are to take a group, or set, apart or are to compare two sets to find by how many they differ. Multiply the numbers if you are to put together groups of equal size.

Oral Tell whether to add, subtract, or multiply to solve each problem. Tell why you decided as you did.

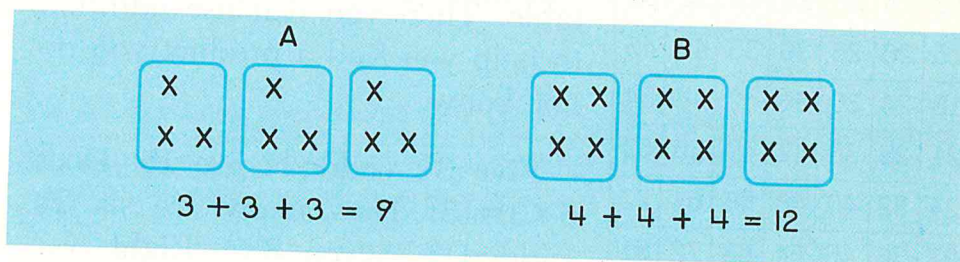
1. If Sally puts 2 pictures on each page of her picture book, how many can she put on 5 pages? *Multiply; sets of equal size are joined* $5 \times 2 = \square$ 10 pictures
2. Joe needs 144 eggs to fill 12 boxes. He has 96 eggs. How many more eggs does he need? *Subtract; sets are compared* $144 - 96 = \square$ 48 eggs
3. Mary used 2 pencils a week each week for 7 weeks. How many pencils did she use? *Multiply; sets of equal size are joined* $7 \times 2 = \square$ 14 pencils
4. Sally's mother had \$5.00. She spent \$3.65 for meat. How much money did she have left? *Subtract; a set is taken apart* $5.00 - 3.65 = \square$ \$1.35
5. Ray had \$6.75 in his savings bank. He put in 75 cents. How much money had he in his bank then? *Add; sets are joined* $6.75 + .75 = \square$ \$7.50
6. Doris bought 2 cartons of pop with 6 bottles in each carton. How many bottles did she buy? *Multiply; sets of equal size are joined* $2 \times 6 = \square$ 12 bottles
7. There were 425 pupils in a school. 196 were girls. How many boys were in the school? *Subtract; a set is taken apart* $425 - 196 = \square$ 229 boys

Written Write an arithmetic statement for each problem above. *Reminder:* The signs \$ and . are not part of an arithmetic statement. Solve each problem. *See above.*

Using a Multiplier of 3

You have been using the multiplications $3 \times 1 = 3$ and $3 \times 2 = 6$.

Look at the pictures below. How many 3's are added in A? What is the sum? How many 4's are added in B? What is the sum?



What is the sum of three 5's? Three 6's? Three 7's? Three 8's? Three 9's? What is the product when you multiply 5, 6, 7, 8, or 9 by 3?

Oral Tell how to use set drawings or addition to prove each multiplication by 3. See examples above.

Written Copy. Replace each \square with a numeral.

- | | | | |
|---|--|--|--|
| 1. $3 \times \overset{9}{\square} = 27$ | $3 \times \overset{15}{\square} = \square$ | $3 \times \overset{27}{\square} = \square$ | $3 \times \overset{6}{\square} = 18$ |
| 2. $\overset{3}{\square} \times 8 = 24$ | $3 \times \overset{18}{\square} = \square$ | $3 \times \overset{9}{\square} = \square$ | $3 \times \overset{7}{\square} = 21$ |
| 3. $3 \times \overset{4}{\square} = 12$ | $2 \times \overset{9}{\square} = 18$ | $3 \times \overset{21}{\square} = \square$ | $\overset{3}{\square} \times 3 = 9$ |
| 4. $\overset{3}{\square} \times 5 = 15$ | $\overset{3}{\square} \times 9 = 27$ | $3 \times \overset{8}{\square} = 24$ | $3 \times \overset{5}{\square} = 15$ |
| 5. $3 \times \overset{3}{\square} = 9$ | $\overset{2}{\square} \times 6 = 12$ | $\overset{3}{\square} \times 7 = 21$ | $3 \times \overset{24}{\square} = \square$ |
| 6. $\overset{3}{\square} \times 4 = 12$ | $\overset{2}{\square} \times 7 = 14$ | $\overset{3}{\square} \times 6 = 18$ | $\overset{2}{\square} \times 5 = 10$ |

Using a Multiplicand of 3

×	1	2	3	4	5	6	7	8	9
1	1	2	3	4	5	6	7	8	9
2	2	4	6	8	10	12	14	16	18
3	3	6	9	12	15	18	21	24	27
4	4	8	12	16	20	24	28	32	36
5	5	10	15	20	25	30	35	40	45
6	6	12	18	24	30	36	42	48	54
7	7	14	21	28	35	42	49	56	63
8	8	16	24	32	40	48	56	64	72
9	9	18	27	36	45	54	63	72	81

The strips on the table help you to see that $4 \times 3 = 12$. What is the product when you multiply 3 by 5, 6, 7, 8, or 9?

You may not always have a table. Then you can use addition to help you find a product you do not know.


Five 3's (added) are 15. Does $5 \times 3 = 15$? How many are six 3's (added)? Seven 3's? Eight 3's? Nine 3's?


Oral Read. Tell each product.

<i>a</i>	<i>b</i>	<i>c</i>	<i>d</i>	<i>e</i>	<i>f</i>	<i>g</i>	<i>h</i>
$\begin{array}{r} 3 \\ \times 6 \\ \hline 18 \end{array}$	$\begin{array}{r} 3 \\ \times 5 \\ \hline 15 \end{array}$	$\begin{array}{r} 3 \\ \times 8 \\ \hline 24 \end{array}$	$\begin{array}{r} 3 \\ \times 7 \\ \hline 21 \end{array}$	$\begin{array}{r} 3 \\ \times 1 \\ \hline 3 \end{array}$	$\begin{array}{r} 3 \\ \times 3 \\ \hline 9 \end{array}$	$\begin{array}{r} 3 \\ \times 4 \\ \hline 12 \end{array}$	$\begin{array}{r} 3 \\ \times 9 \\ \hline 27 \end{array}$

Written Copy in statement form. Write each product.

	<i>a</i>	<i>b</i>	<i>c</i>	<i>d</i>	<i>e</i>	<i>f</i>	<i>g</i>	<i>h</i>
1.	$\begin{array}{r} 2 \\ \times 3 \\ \hline 6 \end{array}$	$\begin{array}{r} 2 \\ \times 1 \\ \hline 2 \end{array}$	$\begin{array}{r} 4 \\ \times 2 \\ \hline 8 \end{array}$	$\begin{array}{r} 3 \\ \times 9 \\ \hline 27 \end{array}$	$\begin{array}{r} 2 \\ \times 4 \\ \hline 8 \end{array}$	$\begin{array}{r} 1 \\ \times 1 \\ \hline 1 \end{array}$	$\begin{array}{r} 2 \\ \times 8 \\ \hline 16 \end{array}$	$\begin{array}{r} 5 \\ \times 2 \\ \hline 10 \end{array}$
2.	$\begin{array}{r} 1 \\ \times 8 \\ \hline 8 \end{array}$	$\begin{array}{r} 3 \\ \times 1 \\ \hline 3 \end{array}$	$\begin{array}{r} 4 \\ \times 1 \\ \hline 4 \end{array}$	$\begin{array}{r} 1 \\ \times 2 \\ \hline 2 \end{array}$	$\begin{array}{r} 3 \\ \times 8 \\ \hline 24 \end{array}$	$\begin{array}{r} 2 \\ \times 2 \\ \hline 4 \end{array}$	$\begin{array}{r} 5 \\ \times 1 \\ \hline 5 \end{array}$	$\begin{array}{r} 3 \\ \times 4 \\ \hline 12 \end{array}$
3.	$\begin{array}{r} 3 \\ \times 2 \\ \hline 6 \end{array}$	$\begin{array}{r} 2 \\ \times 5 \\ \hline 10 \end{array}$	$\begin{array}{r} 1 \\ \times 3 \\ \hline 3 \end{array}$	$\begin{array}{r} 5 \\ \times 3 \\ \hline 15 \end{array}$	$\begin{array}{r} 4 \\ \times 3 \\ \hline 12 \end{array}$	$\begin{array}{r} 3 \\ \times 3 \\ \hline 9 \end{array}$	$\begin{array}{r} 6 \\ \times 3 \\ \hline 18 \end{array}$	$\begin{array}{r} 9 \\ \times 3 \\ \hline 27 \end{array}$
4.	$\begin{array}{r} 9 \\ \times 1 \\ \hline 9 \end{array}$	$\begin{array}{r} 1 \\ \times 9 \\ \hline 9 \end{array}$	$\begin{array}{r} 6 \\ \times 2 \\ \hline 12 \end{array}$	$\begin{array}{r} 7 \\ \times 1 \\ \hline 7 \end{array}$	$\begin{array}{r} 1 \\ \times 4 \\ \hline 4 \end{array}$	$\begin{array}{r} 8 \\ \times 2 \\ \hline 16 \end{array}$	$\begin{array}{r} 3 \\ \times 5 \\ \hline 15 \end{array}$	$\begin{array}{r} 3 \\ \times 7 \\ \hline 21 \end{array}$

A  $4 + 4 + 4 + 4 = 16$ $4 \times 4 = 16$

B  $5 + 5 + 5 + 5 = 20$ $4 \times 5 = 20$

Using 4 as a Multiplier

You already know these multiplication combinations in which 4 is a multiplier: $4 \times 1 = 4$, $4 \times 2 = 8$, and $4 \times 3 = 12$. Use the pictures above to help you answer the following questions. What is the sum of four 4's? Of four 5's? How much is 4 times 4? 4 times 5?

In the additions at the right what is the sum of each repeated addition? Does $4 \times 6 = 24$? Does $4 \times 7 = 28$? Does $4 \times 8 = 32$? Does $4 \times 9 = 36$?

6	7	8	9
6	7	8	9
6	7	8	9
$+6$	$+7$	$+8$	$+9$
<u>24</u>	<u>28</u>	<u>32</u>	<u>36</u>

Oral Read. Supply each product.

<i>a</i>	<i>b</i>	<i>c</i>	<i>d</i>	<i>e</i>	<i>f</i>	<i>g</i>	<i>h</i>	<i>i</i>
1	3	7	9	5	2	4	6	8
$\times 4$	$\times 4$	$\times 4$	$\times 4$	$\times 4$	$\times 4$	$\times 4$	$\times 4$	$\times 4$
<u>4</u>	<u>12</u>	<u>28</u>	<u>36</u>	<u>20</u>	<u>8</u>	<u>16</u>	<u>24</u>	<u>32</u>

Written Copy each statement below. Replace each \square with the missing numeral.

1. $4 \times 3 = \square$	2. $4 \times 8 = \square$	3. $4 \times \square = 16$	4. $\square \times 5 = 20$
5. $4 \times 4 = \square$	6. $\square \times 9 = 36$	7. $4 \times \square = 20$	8. $4 \times 6 = \square$
9. $\square \times 8 = 32$	10. $4 \times 5 = \square$	11. $3 \times \square = 18$	12. $4 \times 7 = \square$
13. $4 \times \square = 36$	14. $\square \times 7 = 28$	15. $4 \times \square = 32$	16. $4 \times 9 = \square$

Using a Multiplicand of 4

Look at the pairs of multiplications shown below. Is the commutative property of multiplication shown below? Explain.

$$\begin{array}{r} 4 \\ \times 5 \\ \hline 20 \end{array} \quad \begin{array}{r} 5 \\ \times 4 \\ \hline 20 \end{array} \quad \begin{array}{r} 4 \\ \times 6 \\ \hline 24 \end{array} \quad \begin{array}{r} 6 \\ \times 4 \\ \hline 24 \end{array} \quad \begin{array}{r} 4 \\ \times 7 \\ \hline 28 \end{array} \quad \begin{array}{r} 7 \\ \times 4 \\ \hline 28 \end{array} \quad \begin{array}{r} 4 \\ \times 8 \\ \hline 32 \end{array} \quad \begin{array}{r} 8 \\ \times 4 \\ \hline 32 \end{array} \quad \begin{array}{r} 4 \\ \times 9 \\ \hline 36 \end{array} \quad \begin{array}{r} 9 \\ \times 4 \\ \hline 36 \end{array}$$

×	1	2	3	4	5	6	7	8	9
1	1	2	3	4	5	6	7	8	9
2	2	4	6	8	10	12	14	16	18
3	3	6	9	12	15	18	21	24	27
4	4	8	12	16	20	24	28	32	36
5	5	10	15	20					
6	6	12	18	24					
7	7	14	21	28					
8	8	16	24	32					
9	9	18	27	36					

Oral Read, think, and do.

- Use addition to find the missing number in: $5 \times 4 = \square$, $6 \times 4 = \square$, and $9 \times 4 = \square$. 20; 24; 36
- Use the multiplication table to replace the \square in $7 \times 4 = \square$, and $4 \times 4 = \square$. 28; 16
- Tell how you would use addition to prove that 4×8 equals 32 and that $8 \times 4 = 32$. See below.

Written Copy. Replace each \square with the missing numeral. Use the multiplication table if you need help.

MORE PRACTICE PAGE 315	⁴ 1. $4 \times \square = 16$	¹² ^b $4 \times 3 = \square$	²⁰ ^c $4 \times 5 = \square$	⁶ ^d $4 \times \square = 24$
	³ 2. $4 \times \square = 12$	²⁴ $4 \times 6 = \square$	²⁸ $4 \times 7 = \square$	⁴ $\square \times 8 = 32$
	⁸ 3. $4 \times \square = 32$	³² $4 \times 8 = \square$	⁴ $\square \times 7 = 28$	⁴ $\square \times 3 = 12$
	⁷ 4. $4 \times \square = 28$	⁵ $4 \times \square = 20$	³⁶ $4 \times 9 = \square$	⁴ $\square \times 6 = 24$
	¹⁶ 5. $4 \times 4 = \square$	⁹ $4 \times \square = 36$	⁴ $\square \times 4 = 16$	⁴ $\square \times 9 = 36$

Practicing Multiplication

Spend time practicing and learning multiplication combinations you do not know. Use a number line or a multiplication table to help you learn them.

Oral Be ready to tell the product for each multiplication below.

<i>a</i>	<i>b</i>	<i>c</i>	<i>d</i>
1. $2 \times 1 = \square$	$4 \times 7 = \square$	$5 \times 1 = \square$	$3 \times 6 = \square$
2. $5 \times 2 = \square$	$1 \times 1 = \square$	$2 \times 2 = \square$	$6 \times 1 = \square$
3. $3 \times 1 = \square$	$8 \times 2 = \square$	$3 \times 7 = \square$	$1 \times 2 = \square$
4. $5 \times 4 = \square$	$2 \times 3 = \square$	$4 \times 1 = \square$	$5 \times 3 = \square$
5. $1 \times 3 = \square$	$4 \times 8 = \square$	$3 \times 2 = \square$	$6 \times 2 = \square$
6. $6 \times 3 = \square$	$2 \times 4 = \square$	$1 \times 4 = \square$	$8 \times 1 = \square$
7. $3 \times 4 = \square$	$8 \times 3 = \square$	$3 \times 3 = \square$	$9 \times 3 = \square$
8. $2 \times 5 = \square$	$4 \times 2 = \square$	$4 \times 9 = \square$	$1 \times 5 = \square$
9. $4 \times 3 = \square$	$1 \times 6 = \square$	$6 \times 4 = \square$	$3 \times 9 = \square$
10. $7 \times 4 = \square$	$4 \times 4 = \square$	$3 \times 5 = \square$	$2 \times 6 = \square$
11. $9 \times 1 = \square$	$2 \times 7 = \square$	$1 \times 7 = \square$	$7 \times 1 = \square$
12. $1 \times 8 = \square$	$4 \times 5 = \square$	$2 \times 9 = \square$	$8 \times 4 = \square$
13. $3 \times 8 = \square$	$7 \times 2 = \square$	$4 \times 6 = \square$	$7 \times 3 = \square$
14. $9 \times 4 = \square$	$2 \times 8 = \square$	$9 \times 2 = \square$	$1 \times 9 = \square$

Written Write each multiplication above in column form. Write each product. See above.

Using 5 as a Multiplier

You have been using some multiplication combinations with a multiplier of 5. They are shown at the right. How many do you know?

$$\begin{array}{r} 1 \\ \times 5 \\ \hline 5 \end{array} \quad \begin{array}{r} 2 \\ \times 5 \\ \hline 10 \end{array} \quad \begin{array}{r} 3 \\ \times 5 \\ \hline 15 \end{array} \quad \begin{array}{r} 4 \\ \times 5 \\ \hline 20 \end{array}$$

The additions below show how to find the products $5 \times 5 = \square$, $5 \times 6 = \square$, $5 \times 7 = \square$, $5 \times 8 = \square$, and $5 \times 9 = \square$.

$$5 + 5 + 5 + 5 + 5 = 25$$

$$5 \times 5 = 25$$

$$6 + 6 + 6 + 6 + 6 = 30$$

$$5 \times 6 = 30$$

$$7 + 7 + 7 + 7 + 7 = 35$$

$$5 \times 7 = 35$$

$$8 + 8 + 8 + 8 + 8 = 40$$

$$5 \times 8 = 40$$

$$9 + 9 + 9 + 9 + 9 = 45$$

$$5 \times 9 = 45$$

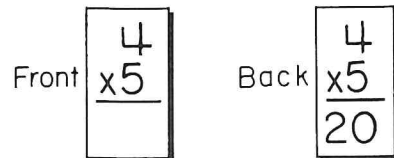
Oral Read. Replace each \square with a number word.

Numerals only are given.

- | | | | |
|---|--------------------------------------|--------------------------------------|--------------------------------------|
| 1. $5 \times \overset{7}{\square} = 35$ | $5 \times 8 = \overset{40}{\square}$ | $5 \times \overset{6}{\square} = 30$ | $\overset{5}{\square} \times 7 = 35$ |
| 2. $5 \times 9 = \overset{45}{\square}$ | $5 \times \overset{4}{\square} = 20$ | $5 \times 6 = \overset{30}{\square}$ | $5 \times 5 = \overset{25}{\square}$ |
| 3. $\overset{5}{\square} \times 7 = 35$ | $5 \times \overset{9}{\square} = 45$ | $\overset{5}{\square} \times 4 = 20$ | $5 \times \overset{8}{\square} = 40$ |
| 4. $\overset{5}{\square} \times 6 = 30$ | $\overset{5}{\square} \times 1 = 5$ | $\overset{5}{\square} \times 3 = 15$ | $\overset{5}{\square} \times 5 = 25$ |
| 5. $5 \times \overset{3}{\square} = 15$ | $5 \times \overset{5}{\square} = 25$ | $5 \times 2 = \overset{10}{\square}$ | $\overset{5}{\square} \times 3 = 15$ |

Written Copy rows 1 through 5 above. Replace each \square with a numeral. See above.

Something to do Make practice cards for multiplications with multipliers of 1 through 5.



Using a Multiplicand of 5

How can you use the table to help you check each multiplication below?

$3 \times 5 = 15$

$7 \times 5 = 35$

$6 \times 5 = 30$

$8 \times 5 = 40$

$9 \times 5 = 45$

$4 \times 5 = 20$

How can you use addition to check each multiplication above? Is multiplication a quick way of adding?

×	1	2	3	4	5	6	7	8	9
1	1	2	3	4	5	6	7	8	9
2	2	4	6	8	10	12	14	16	18
3	3	6	9	12	15	18	21	24	27
4	4	8	12	16	20	24	28	32	36
5	5	10	15	20	25	30	35	40	45
6	6	12	18	24	30				
7	7	14	21	28	35				
8	8	16	24	32	40				
9	9	18	27	36	45				

Oral Read. Be ready to tell each product.

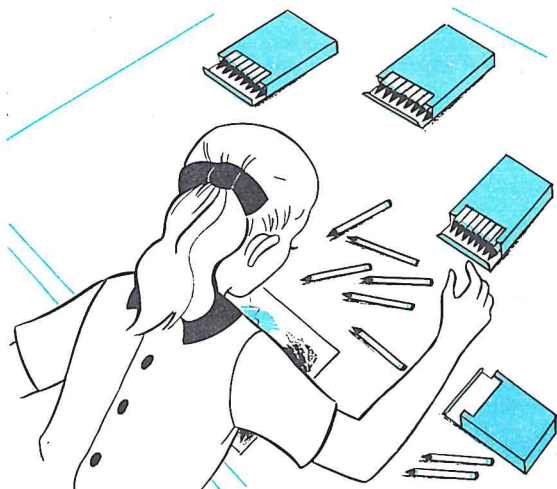
$\begin{array}{r} a \\ 5 \\ \times 9 \\ \hline 45 \end{array}$	$\begin{array}{r} b \\ 5 \\ \times 4 \\ \hline 20 \end{array}$	$\begin{array}{r} c \\ 5 \\ \times 3 \\ \hline 15 \end{array}$	$\begin{array}{r} d \\ 5 \\ \times 1 \\ \hline 5 \end{array}$	$\begin{array}{r} e \\ 5 \\ \times 7 \\ \hline 35 \end{array}$	$\begin{array}{r} f \\ 5 \\ \times 8 \\ \hline 40 \end{array}$	$\begin{array}{r} g \\ 5 \\ \times 5 \\ \hline 25 \end{array}$	$\begin{array}{r} h \\ 5 \\ \times 6 \\ \hline 30 \end{array}$	$\begin{array}{r} i \\ 5 \\ \times 2 \\ \hline 10 \end{array}$
--	--	--	---	--	--	--	--	--

Written Copy. Replace each \square with a numeral.

1. $8 \times \overset{5}{\square} = 40$	$\overset{6}{\square} \times 5 = 30$	$5 \times \overset{25}{\square} = \square$	$8 \times \overset{40}{\square} = \square$
2. $7 \times \overset{5}{\square} = 35$	$9 \times \overset{45}{\square} = \square$	$6 \times \overset{5}{\square} = 30$	$7 \times \overset{35}{\square} = \square$
3. $\overset{5}{\square} \times 5 = 25$	$\overset{7}{\square} \times 5 = 35$	$6 \times \overset{30}{\square} = \square$	$4 \times \overset{20}{\square} = \square$
4. $\overset{5}{\square} \times 9 = 45$	$\overset{4}{\square} \times 5 = 20$	$3 \times \overset{15}{\square} = \square$	$4 \times \overset{5}{\square} = 20$

Something to do Make a multiplication table through 5 like the one above. Keep it in your notebook so that you can refer to it easily whenever you wish to. Do not shade the empty portion; you will fill that in later as you learn more multiplications.

MORE PRACTICE
PAGE 315



Solving Problems

Read each problem carefully and decide how to solve it. Add the numbers if you are to put groups, or sets, together. Multiply the numbers if you are to put together groups of equal size. How can you decide when to subtract?

Oral Tell how you would solve each problem. Tell why you decided as you did.

- Betty had 4 boxes of crayons. Each box contained 8. How many crayons did she have altogether? *Multiply; sets of equal size are joined $4 \times 8 = \square$ 32 crayons*
- Mary weighed 67 pounds. Her father weighed 150 pounds. How much lighter is Mary than her father? *Subtract; sets are compared $150 - 67 = \square$ 83 pounds*
- Bill gave 8 marbles apiece to each of 4 friends. How many marbles in all did he give away? *Multiply; sets of equal size are joined $4 \times 8 = \square$ 32 marbles*
- Dick's father sold 1450 bushels of wheat in the fall and 975 bushels in the spring. How many bushels of wheat did he sell altogether? *Add; sets are joined $1450 + 975 = \square$ 2425 bushels*
- Betty can make 5 bows for wrapping gift packages from a roll of ribbon. She has 9 rolls of ribbon. How many bows can she make? *Multiply; sets of equal size are joined $9 \times 5 = \square$ 45 bows*

Written Write the arithmetic statement to use in solving each problem above. Find the missing number. Read the problem again to see if your answer is sensible. Then write your answer. *See above.*

Because the procedure in using this page parallels that of previous pages of *Checkup Time* (see T181 or T161), no page T233 is included.

Checkup Time

The numerals in () tell the pages where you can turn for help if you need it.

Important Ideas

1. Two or more groups each containing the same number of objects can be thought of as *groups of equal size*. (213)

2. A way to repeatedly add the same number is to multiply. (215)

3. Changing the order of the factors does not change the product. (218)

4. One is the identity number of multiplication. (218)

Words to Know

1. Times, \times (215)
2. Multiply (215)
3. Product (216)
4. Multiplier (217)
5. Multiplicand (217)

Questions to Discuss

See below.

1. When can you use multiplication to add quickly? (215)

1. When the numbers to be added are identical
2. By using repeated addition
3. Find the numeral at the intersection of the multiplier row and multiplicand column

2. How can you use a number line to help you discover a product? (218, 221)

3. How can you use a multiplication table to discover a product? (222)

Oral Practice

Tell how to find the product in each of the following. Tell the product. (220, 225, 230) **Use repeated addition.**

<i>a</i>	<i>b</i>	<i>c</i>	<i>d</i>
$\begin{array}{r} 4 \\ \times 2 \\ \hline 8 \end{array}$	$\begin{array}{r} 7 \\ \times 2 \\ \hline 14 \end{array}$	$\begin{array}{r} 1 \\ \times 5 \\ \hline 5 \end{array}$	$\begin{array}{r} 2 \\ \times 3 \\ \hline 6 \end{array}$

Tell what arithmetic statement to write for each problem. (223)

1. Ann gave 4 tickets to each of 3 friends. How many tickets did she give to her friends?

$3 \times 4 = \square$ 12 tickets

2. Sam counted 8 crayons in a new box. How many crayons would there be in 2 boxes? $2 \times 8 = \square$ 16 crayons

3. Joe could plant 8 tulips in 1 row in his garden. How many could he plant in 5 rows? $5 \times 8 = \square$ 40 tulips

Self-Evaluation

Part 1 Copy. Write each sum, difference, or product.

	<i>a</i>	<i>b</i>	<i>c</i>	<i>d</i>
1.	$\begin{array}{r} 476 \\ -364 \\ \hline 112 \end{array}$	$\begin{array}{r} 533 \\ +125 \\ \hline 658 \end{array}$	$\begin{array}{r} 422 \\ -147 \\ \hline 275 \end{array}$	$\begin{array}{r} 398 \\ +274 \\ \hline 672 \end{array}$
2.	$\begin{array}{r} 954 \\ +246 \\ \hline 1200 \end{array}$	$\begin{array}{r} 479 \\ -247 \\ \hline 232 \end{array}$	$\begin{array}{r} 500 \\ -237 \\ \hline 263 \end{array}$	$\begin{array}{r} 873 \\ +868 \\ \hline 1741 \end{array}$
3.	$\begin{array}{r} 1 \\ \times 5 \\ \hline 5 \end{array}$	$\begin{array}{r} 1 \\ \times 2 \\ \hline 2 \end{array}$	$\begin{array}{r} 3 \\ \times 5 \\ \hline 15 \end{array}$	$\begin{array}{r} 3 \\ \times 3 \\ \hline 9 \end{array}$
4.	$\begin{array}{r} 9 \\ \times 3 \\ \hline 27 \end{array}$	$\begin{array}{r} 3 \\ \times 9 \\ \hline 27 \end{array}$	$\begin{array}{r} 5 \\ \times 7 \\ \hline 35 \end{array}$	$\begin{array}{r} 4 \\ \times 7 \\ \hline 28 \end{array}$
5.	$\begin{array}{r} 4 \\ \times 6 \\ \hline 24 \end{array}$	$\begin{array}{r} 5 \\ \times 4 \\ \hline 20 \end{array}$	$\begin{array}{r} 3 \\ \times 1 \\ \hline 3 \end{array}$	$\begin{array}{r} 6 \\ \times 4 \\ \hline 24 \end{array}$
6.	$\begin{array}{r} 2 \\ \times 3 \\ \hline 6 \end{array}$	$\begin{array}{r} 6 \\ \times 5 \\ \hline 30 \end{array}$	$\begin{array}{r} 4 \\ \times 1 \\ \hline 4 \end{array}$	$\begin{array}{r} 1 \\ \times 4 \\ \hline 4 \end{array}$
7.	$\begin{array}{r} 7 \\ \times 5 \\ \hline 35 \end{array}$	$\begin{array}{r} 5 \\ \times 6 \\ \hline 30 \end{array}$	$\begin{array}{r} 6 \\ \times 5 \\ \hline 30 \end{array}$	$\begin{array}{r} 4 \\ \times 8 \\ \hline 32 \end{array}$
8.	$\begin{array}{r} 2 \\ \times 6 \\ \hline 12 \end{array}$	$\begin{array}{r} 3 \\ \times 4 \\ \hline 12 \end{array}$	$\begin{array}{r} 4 \\ \times 3 \\ \hline 12 \end{array}$	$\begin{array}{r} 7 \\ \times 3 \\ \hline 21 \end{array}$

Part 2 Write the sign you can use for each pair of words below.

1. Add, plus +
2. Subtract, minus -
3. Equals, equal =
4. Multiply, times x

Part 3 Write each problem in the language of arithmetic and solve it.

1. Sue put 5 pictures on each of 5 pages in her picture book. How many pictures did she use?

$$5 \times 5 = \square \quad 25 \text{ pictures}$$

2. Paul's uncle needs 4 boards. Each must be 4 feet long. How many feet of board does he need?

$$4 \times 4 = \square \quad 16 \text{ feet}$$

3. Mike sold 13 boxes of soap Tuesday and 18 boxes of soap Wednesday. How many boxes of soap did he sell altogether?

$$13 + 18 = \square \quad 31 \text{ boxes}$$

4. Each of 4 girls made 5 sandwiches. How many sandwiches in all did the girls make?

$$4 \times 5 = \square \quad 20 \text{ sandwiches}$$

5. Mother gave each of 4 boys 6 pieces of candy. How many pieces of candy did she give?

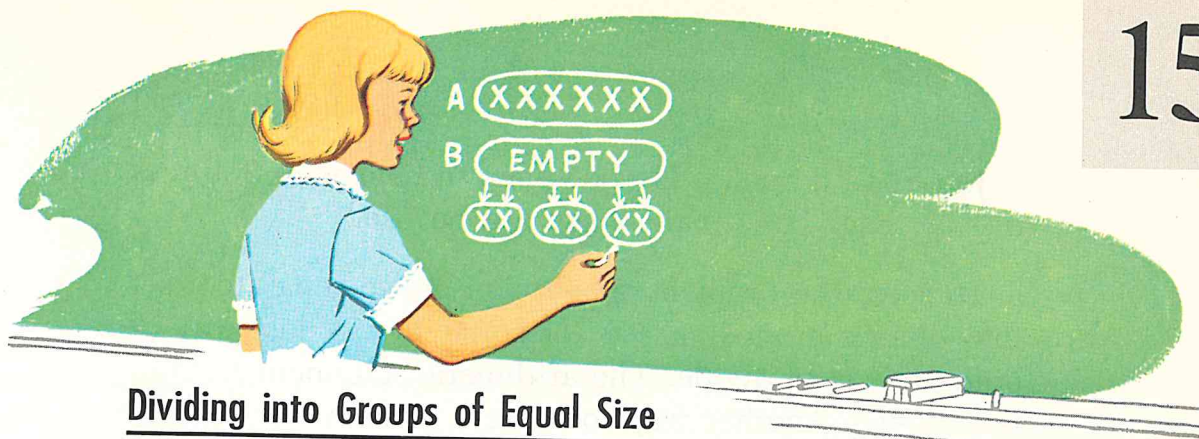
$$4 \times 6 = \square \quad 24 \text{ pieces}$$

6. Mark counted 6 eggs in each of 3 cartons. How many eggs were there in all 3 cartons?

$$3 \times 6 = \square \quad 18 \text{ eggs}$$

7. Kathy needs 7 pieces of string, each 3 feet long. How many feet of string does she need altogether?

$$7 \times 3 = \square \quad 21 \text{ feet}$$



Dividing into Groups of Equal Size

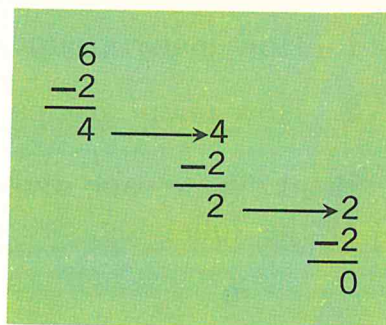
Susan wants to rearrange a group of 6 children into groups of 2 children each. She has drawn a set of X's in A to stand for 6 children.

To solve her problem Susan has drawn the diagram in B. Do you see that Susan could arrange a group of 6 children into 3 groups of 2 children?

Susan could also find how many groups of 2 are contained in 6 by subtracting as shown below.

What number remains after 3 subtractions of 2 each are made? Now you can see that there are 3 groups, or sets, of 2 in 6.

The short form for showing that there are 3 groups, or sets, of 2 in 6 is $6 \div 2 = 3$. It is read: "Six divided by two equals three."



Oral Read each statement below.

a
1. $6 \div 3 = 2$

b
 $8 \div 2 = 4$

c
 $8 \div 4 = 2$

2. $9 \div 3 = 3$

$4 \div 2 = 2$

$3 \div 1 = 3$

Using Division

Jerry had 6 apples. He put them in bags with 3 apples in each bag. How many bags did he use?

To solve the problem above, you are to separate a set into smaller groups, or sets, of equal size. A fast way of doing this is to **divide**. The arithmetic statement is $6 \div 3 = \square$. Another way to write it is shown at the right. The sign \div and the sign $\overline{)}$ both mean *divide*.

$$\begin{array}{r} 3 \overline{)6} \end{array}$$

Look at the division at the right. In the division, 6 is called the **dividend**, 2 the **divisor**, and 3 the **quotient**. The division statement is written: $6 \div 2 = 3$.

$$\begin{array}{rcc} & 3 & \text{quotient} \\ \text{divisor } 2 & \overline{)6} & \text{dividend} \end{array}$$

Oral Tell which division statement you would write to help you answer each question below. See example above.

1. How many groups of 2 are contained in 8? $8 \div 2 = \square$

2. How many groups of 4 are contained in 8? $8 \div 4 = \square$

Read. Name each divisor, dividend, and quotient in each of the following. See example above.

$$\begin{array}{r} a \\ 3. \quad 2 \\ 3 \overline{)6} \end{array}$$

$$\begin{array}{r} b \\ 3 \\ 2 \overline{)6} \end{array}$$

$$\begin{array}{r} c \\ 3 \\ 3 \overline{)9} \end{array}$$

$$\begin{array}{r} 4. \quad 2 \\ 4 \overline{)8} \end{array}$$

$$\begin{array}{r} 4 \\ 2 \overline{)8} \end{array}$$

$$\begin{array}{r} 4 \\ 1 \overline{)4} \end{array}$$

$$5. \quad 8 \div 4 = 2$$

$$8 \div 2 = 4$$

$$4 \div 1 = 4$$

$$\begin{array}{r} 2 \\ 2 \\ 2 \\ 2 \\ + 2 \\ \hline 8 \end{array}$$

$$\begin{array}{r} 2 \\ \times 4 \\ \hline 8 \end{array}$$

$$C \quad 8 \div 2 = 4$$

$$D \quad \begin{array}{r} 4 \\ 2 \overline{) 8} \end{array}$$

Addition, Multiplication, and Division

Just as knowing addition helps you with multiplication, so knowing multiplication helps you with division.

Look at A above. How many 2's are added to make 8? How many 2's are contained in 8? Now look at B. Do you see that multiplication is a short way to show that four 2's equal 8? Now compare B to C and D.

To use multiplication to help you divide 8 by 2, *think*: "How many times is 2 contained in 8? 4 times 2 equals 8. Thus there are 4 groups, or sets, of 2 in 8."

Because division undoes multiplication, division is called the inverse operation of multiplication.

Oral Read. Replace each \square with a number word. Use a , b , and c to help you complete d . *Numerals only are given.*

$$1. \quad \begin{array}{c} a \\ 2 + 2 + 2 = \square \end{array} \quad \begin{array}{c} 6 \end{array}$$

$$b \quad 3 \times 2 = \square \quad \begin{array}{c} 6 \end{array}$$

$$c \quad 6 = \square \times 2$$

$$d \quad \begin{array}{r} 3 \\ 2 \overline{) 6} \end{array}$$

$$2. \quad 3 + 3 = \square \quad \begin{array}{c} 6 \end{array}$$

$$2 \times 3 = \square \quad \begin{array}{c} 6 \end{array}$$

$$6 = \square \times 3 \quad \begin{array}{c} 2 \end{array}$$

$$3 \overline{) 6} \quad \begin{array}{c} 2 \end{array}$$

$$3. \quad 2 + 2 + 2 + 2 = \square \quad \begin{array}{c} 8 \end{array}$$

$$4 \times 2 = \square \quad \begin{array}{c} 8 \end{array}$$

$$8 = \square \times 2 \quad \begin{array}{c} 4 \end{array}$$

$$2 \overline{) 8} \quad \begin{array}{c} 4 \end{array}$$

$$4. \quad 4 + 4 = \square \quad \begin{array}{c} 8 \end{array}$$

$$2 \times 4 = \square \quad \begin{array}{c} 8 \end{array}$$

$$8 = \square \times 4 \quad \begin{array}{c} 2 \end{array}$$

$$4 \overline{) 8} \quad \begin{array}{c} 2 \end{array}$$

Written Copy rows 1 through 4 above. Replace each \square in a , b , and c with the correct numeral. Write each quotient in d . *See above.*

Using 1 as a Divisor

Doris had 5 cups. She wanted to put them onto hooks with 1 cup on each hook. How many hooks did she need?

To find the number of hooks, you are to separate a set into smaller sets of equal size; so you divide. The arithmetic statement is $5 \div 1 = \square$.

Think: "How many times is 1 contained in 5?" The answer is 5. There are 5 smaller sets of 1 in a set of 5. Dividing 5 by 1 gives a quotient of 5.

See what happens when you divide numbers by 1.

$$1 \div 1 = 1$$

$$4 \div 1 = 4$$

$$7 \div 1 = 7$$

$$2 \div 1 = 2$$

$$5 \div 1 = 5$$

$$8 \div 1 = 8$$

$$3 \div 1 = 3$$

$$6 \div 1 = 6$$

$$9 \div 1 = 9$$

Since a number is not changed when divided by one, one is the *identity number of division*.

Oral Read. Replace each \square with a number word.

Numerals only are given.

a
1. $1 \times 1 = \square$

b
 $1 \div 1 = \square$

c
 $4 \times 1 = \square$

d
 $4 \div 1 = \square$

2. $5 \times 1 = \square$

$5 \div 1 = \square$

$2 \times 1 = \square$

$2 \div 1 = \square$

3. $3 \times 1 = \square$

$3 \div 1 = \square$

$6 \times 1 = \square$

$6 \div 1 = \square$

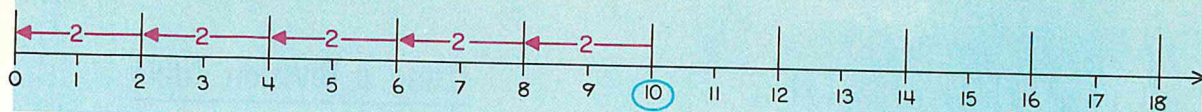
4. $8 \times 1 = \square$

$8 \div 1 = \square$

$7 \times 1 = \square$

$7 \div 1 = \square$

Written Copy rows 1 through 4 above. Replace each \square with the correct numeral. *See above.*



Using 2 as a Divisor

Look at the number line above. Do you see how you can begin at 10 and use repeated subtraction to find how many 2's are contained in 10? 2 is contained in 10 five times. How many 2's are contained in 2? In 4? In 6? In 8? In 12? In 14? In 16? In 18? In zero?

A fast way to divide one number by another is to use what you know about multiplication. To find the quotient in $10 \div 2 = \square$, think: "Which number times 2 equals 10?" $5 \times 2 = 10$. Then $10 \div 2 = 5$.

Oral Read. Replace each \square with a number word.

Numerals only are given.

<i>a</i>	<i>b</i>	<i>c</i>
1. $1 \times 2 = \square$	$2 = \square \times 2$	$2 \div 1 = \square$
2. $2 \times 2 = \square$	$4 = \square \times 2$	$4 \div 2 = \square$
3. $3 \times 2 = \square$	$6 = \square \times 2$	$6 \div 2 = \square$
4. $4 \times 2 = \square$	$8 = \square \times 2$	$8 \div 2 = \square$
5. $5 \times 2 = \square$	$\square \times 2 = 10$	$10 \div 2 = \square$
6. $6 \times 2 = \square$	$\square \times 2 = 12$	$12 \div 2 = \square$
7. $7 \times 2 = \square$	$\square \times 2 = 14$	$14 \div 2 = \square$
8. $8 \times 2 = \square$	$\square \times 2 = 16$	$16 \div 2 = \square$
9. $9 \times 2 = \square$	$\square \times 2 = 18$	$18 \div 2 = \square$

Written Copy rows 1 through 9. Replace each \square with the correct numeral. *See above.*

MORE PRACTICE

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÷	1	2	3	4	5	6	7	8	9
1	1	2	3	4	5	6	7	8	9
2	2	4	6	8	10	12	14	16	18
3	3	6	9	12	15	18	21	24	27
4	4	8	12						
5	5	10	15						
6	6	12	18						
7	7	14	21						
8	8	16	24						
9	9	18	27						

Division Table

Using a Division Table

The division table is made in the same way as a multiplication table. The table at the left shows all of the divisions you have studied, and some you will study on page 241. The strips show how to find that 12 divided by 2 equals 6.

Suppose you knew that 12 divided by some number was equal to 6, as in the statement

$12 \div \square = 6$. How would you find the number?

Oral Read. Replace each \square with a number word.

Numerals only are given.

- | | | | |
|--------------------------|-----------------------|-----------------------|-----------------------|
| a | b | c | d |
| 1. $14 \div 2 = \square$ | $10 \div 2 = \square$ | $2 \div 2 = \square$ | $4 \div 2 = \square$ |
| 2. $12 \div 2 = \square$ | $8 \div 2 = \square$ | $\square \div 2 = 6$ | $16 \div 2 = \square$ |
| 3. $6 \div 2 = \square$ | $2 \div \square = 1$ | $18 \div 2 = \square$ | $18 \div \square = 9$ |
| 4. $7 \div 1 = \square$ | $\square \div 2 = 9$ | $\square \div 1 = 6$ | $6 \div \square = 6$ |
| 5. $12 \div \square = 6$ | $\square \div 2 = 4$ | $\square \div 1 = 5$ | $\square \div 2 = 5$ |

Written Copy rows 1 through 5. Replace each \square with the correct numeral. See above.

Something to do. Make a division table of your own. Place it in your notebook where you can refer to it easily. You will complete the table for other divisions in later lessons.

Using 3 as a Divisor

Use the table on page 240 to help you show that each statement below is correct.

$3 \div 3 = 1$

$12 \div 3 = 4$

$21 \div 3 = 7$

$6 \div 3 = 2$

$15 \div 3 = 5$

$24 \div 3 = 8$

$9 \div 3 = 3$

$18 \div 3 = 6$

$27 \div 3 = 9$

How many 3's are contained in 3? In 6? In 9? Which number times 3 is equal to 12? To 15? To 21? Which number divided by 3 equals 7? 8? 9?

Oral Read. Replace each \square with a number word.

Numerals only are given.

- | <i>a</i> | <i>b</i> | <i>c</i> | <i>d</i> |
|--------------------------|-----------------------|-----------------------|-----------------------|
| 1. $6 \div 3 = \square$ | $12 \div 3 = \square$ | $\square \div 3 = 1$ | $15 \div \square = 5$ |
| 2. $15 \div 3 = \square$ | $18 \div \square = 6$ | $\square \div 2 = 6$ | $9 \div \square = 3$ |
| 3. $\square \div 3 = 4$ | $9 \div 3 = \square$ | $21 \div \square = 7$ | $18 \div 3 = \square$ |
| 4. $21 \div \square = 7$ | $\square \div 2 = 7$ | $12 \div \square = 4$ | $24 \div 3 = \square$ |
| 5. $\square \div 3 = 3$ | $\square \div 3 = 6$ | $24 \div \square = 8$ | $3 \div \square = 1$ |
| 6. $27 \div 3 = \square$ | $3 \div 3 = \square$ | $\square \div 3 = 7$ | $27 \div \square = 9$ |
| 7. $6 \div \square = 2$ | $\square \div 3 = 8$ | $\square \div 3 = 9$ | $3 \div 1 = \square$ |
| 8. $21 \div 3 = \square$ | $\square \div 3 = 7$ | $18 \div \square = 9$ | $\square \div 3 = 5$ |
| 9. $\square \div 3 = 2$ | $\square \div 2 = 8$ | $\square \div 2 = 3$ | $\square \div 2 = 5$ |

Written Copy rows 1 through 9 above. Replace each \square with the correct numeral. *See above.*

Finding the Number of Groups of Equal Size

Sue has 16 slices of bread. She uses 2 slices for each sandwich she makes. How many sandwiches can she make if she uses all of the bread?

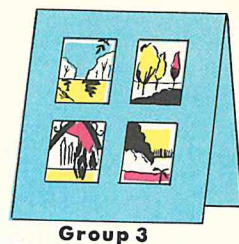
Sue can separate the slices into equal groups of 2. To find how many 2's are contained in 16, you can use repeated subtraction. A better way is to divide. The arithmetic statement is $16 \div 2 = \square$. The missing numeral is 8. Sue can make 8 sandwiches.

Oral Tell the arithmetic statement you would use in solving each problem below. Tell how you decided.

See below.

1. Mary took 16 ankle socks from the dryer. She folded the socks in pairs. Then how many pairs of socks did she have? $16 \div 2 = \square$ 8 pairs
2. Bob had 15 books. He put them into stacks of 3 books each. How many stacks of books did he have? $15 \div 3 = \square$ 5 stacks
3. Barbara had 12 candy eggs. She put 2 eggs on each plate. How many plates did she use? $12 \div 2 = \square$ 6 plates
4. Dick's father had 12 cup hooks. He put the hooks up in rows of 3 cup hooks each. How many rows did he have? $12 \div 3 = \square$ 4 rows
5. Laura needs 2 sheets of paper to make a party hat. How many hats can she make from 18 sheets of paper? $18 \div 2 = \square$ 9 hats
6. Doris had 18 pieces of paper to hand out. She used all of them as she gave each pupil 3 pieces. How many pupils received paper? $18 \div 3 = \square$ 6 pupils

Written Solve problems 1 through 6 above. See above.



Finding How Many in Each Group of Equal Size

Doris had 12 pictures. She planned to paste them on 3 pieces of cardboard with the same number of pictures on each piece. How many pictures should she paste on each piece of cardboard?

The problem could be solved by arranging the pictures in 3 groups of equal size as shown above. There are 4 pictures in each group.

Using a diagram is a slow way to solve the problem. A faster way is to write it as an arithmetic statement, like this: $12 \div \square = 3$. You can find the value of \square by dividing 12 by 3. $12 \div 3 = 4$.

Oral Be ready to tell what picture you might draw to help you solve each problem below. Tell what arithmetic statement you would use.

1. Dick had 18 chairs to put around 3 tables with the same number of chairs at each table. How many chairs should he put at each table? $18 \div 3 = \square$ 6 chairs
2. 27 players were put on 3 teams with the same number of players on each team. How many players were on each team? $27 \div 3 = \square$ 9 players

Written Write problems 1 and 2 in the language of arithmetic. Solve each problem. See above.

Using 4 as a Divisor

In the table below, the row beginning with 4 can be filled in by skip counting by 4's. There is 1 set of 4 in 4. There are 2 sets of 4 in 8. How many sets of 4 are in 12? In 16? In 20? In 24? In 0?

Use the table to see if each of these matching multiplication and division combinations is correct.

÷	1	2	3	4	5	6	7	8	9
1	1	2	3	4	5	6	7	8	9
2	2	4	6	8	10	12	14	16	18
3	3	6	9	12	15	18	21	24	27
4	4	8	12	16	20	24	28	32	36
5	5	10	15	20	25	30	35	40	45
6	6	12	18	24	30				
7	7	14	21	28	35				
8	8	16	24	32	40				
9	9	18	27	36	45				

$2 \times 4 = 8$

$8 \div 4 = 2$

$3 \times 4 = 12$

$12 \div 4 = 3$

$4 \times 4 = 16$

$16 \div 4 = 4$

$5 \times 4 = 20$

$20 \div 4 = 5$

$6 \times 4 = 24$

$24 \div 4 = 6$

$7 \times 4 = 28$

$28 \div 4 = 7$

$8 \times 4 = 32$

$32 \div 4 = 8$

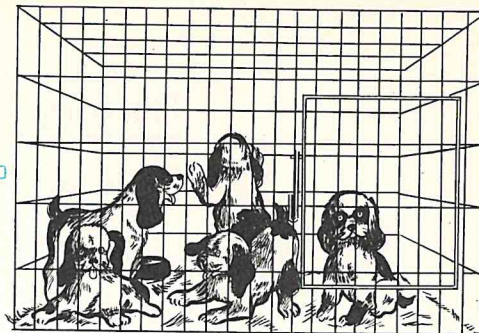
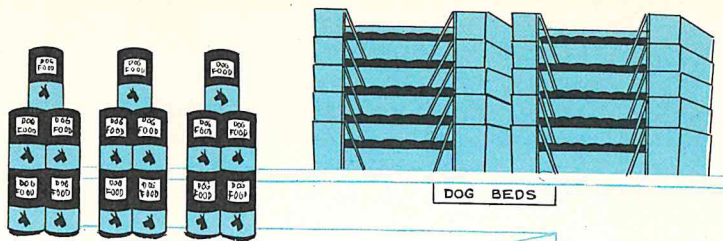
$9 \times 4 = 36$

$36 \div 4 = 9$

Oral Read. Replace each \square with a number word.
Numerals only are given.

- | | | | |
|--------------------------|-----------------------|-----------------------|-----------------------|
| a | b | c | d |
| 1. $12 \div 4 = \square$ | $8 \div 4 = \square$ | $16 \div 4 = \square$ | $4 \div \square = 1$ |
| 2. $4 \div 4 = \square$ | $20 \div 4 = \square$ | $24 \div 4 = \square$ | $32 \div 4 = \square$ |
| 3. $\square \div 4 = 5$ | $28 \div 4 = \square$ | $12 \div \square = 3$ | $36 \div \square = 9$ |
| 4. $28 \div \square = 7$ | $36 \div 4 = \square$ | $20 \div \square = 5$ | $0 \div 4 = \square$ |

Written Copy rows 1 through 4. Replace each \square with a numeral. See above.



Using 5 as a Divisor

The table on page 244 shows that there is 1 set of 5 in 5. There are 2 sets of 5 in 10. How many sets of 5 are in 15? In 20? In 25? In 30? In 35? In 40? In 45?

Matching multiplication and division combinations are shown below. Study them.

$$2 \times 5 = 10$$

$$10 \div 5 = 2$$

$$3 \times 5 = 15$$

$$15 \div 5 = 3$$

$$4 \times 5 = 20$$

$$20 \div 5 = 4$$

$$5 \times 5 = 25$$

$$25 \div 5 = 5$$

$$6 \times 5 = 30$$

$$30 \div 5 = 6$$

$$7 \times 5 = 35$$

$$35 \div 5 = 7$$

$$8 \times 5 = 40$$

$$40 \div 5 = 8$$

$$9 \times 5 = 45$$

$$45 \div 5 = 9$$

Oral Read. Tell each quotient.

$$1. \quad \overset{a}{\overset{8}{3}} \overline{)24}$$

$$\overset{b}{\overset{9}{3}} \overline{)27}$$

$$\overset{c}{\overset{4}{1}} \overline{)4}$$

$$\overset{d}{\overset{1}{5}} \overline{)5}$$

$$\overset{e}{\overset{3}{3}} \overline{)9}$$

$$\overset{f}{\overset{5}{4}} \overline{)20}$$

$$2. \quad \overset{5}{5} \overline{)25}$$

$$\overset{6}{3} \overline{)18}$$

$$\overset{8}{4} \overline{)32}$$

$$\overset{3}{5} \overline{)15}$$

$$\overset{7}{4} \overline{)28}$$

$$\overset{7}{5} \overline{)35}$$

$$3. \quad \overset{5}{3} \overline{)15}$$

$$\overset{4}{5} \overline{)20}$$

$$\overset{6}{4} \overline{)24}$$

$$\overset{9}{5} \overline{)45}$$

$$\overset{9}{4} \overline{)36}$$

$$\overset{7}{3} \overline{)21}$$

$$4. \quad \overset{8}{2} \overline{)16}$$

$$\overset{5}{2} \overline{)10}$$

$$\overset{6}{5} \overline{)30}$$

$$\overset{4}{4} \overline{)16}$$

$$\overset{9}{2} \overline{)18}$$

$$\overset{8}{5} \overline{)40}$$

Written Copy rows 1 through 4 above. Write each quotient. See above.

MORE PRACTICE

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Practicing Addition, Subtraction, and Multiplication

You should be able to do this page by yourself.

Written Copy. Write each sum. Check.

	<i>a</i>	<i>b</i>	<i>c</i>	<i>d</i>	<i>e</i>	<i>f</i>
1.	75 30 18 <u>+24</u> 147	38 65 24 <u>+79</u> 206	94 17 56 <u>+83</u> 250	27 48 90 <u>+35</u> 200	63 79 25 <u>+40</u> 207	81 52 67 <u>+96</u> 296
2.	3247 605 4730 <u>+98</u> 8680	436 927 879 <u>+000</u> 2242	621 450 5968 <u>+872</u> 7911	6312 1708 954 <u>+260</u> 9234	\$17.62 9.87 60.04 <u>+3.21</u> \$90.74	\$6.89 32.60 .66 <u>+54.27</u> \$94.42

Copy. Write each difference. Check.

	<i>a</i>	<i>b</i>	<i>c</i>	<i>d</i>	<i>e</i>	<i>f</i>
1.	6325 <u>-3970</u> 2355	5376 <u>-4129</u> 1247	8720 <u>-3842</u> 4878	2623 <u>-512</u> 2111	7669 <u>-2846</u> 4823	3628 <u>-1352</u> 2276
2.	4001 <u>-1345</u> 2656	3085 <u>-2497</u> 588	5608 <u>-1219</u> 4389	7665 <u>-2846</u> 4819	9243 <u>-6078</u> 3165	8724 <u>-5867</u> 2857

Copy. Write each product. Check.

	<i>a</i>	<i>b</i>	<i>c</i>	<i>d</i>	<i>e</i>	<i>f</i>	<i>g</i>
1.	0 <u>×4</u> 0	9 <u>×3</u> 27	1 <u>×5</u> 5	7 <u>×3</u> 21	6 <u>×4</u> 24	6 <u>×5</u> 30	3 <u>×4</u> 12
	3	7	8	2	4	7	9
2.	<u>×5</u> 15	<u>×4</u> 28	<u>×5</u> 40	<u>×4</u> 8	<u>×5</u> 20	<u>×5</u> 35	<u>×4</u> 36

Can you do this? Make up and write story problems for *a*, *b*, and *c* below.

<i>a</i> 10	<i>b</i> 1847	<i>c</i> 117
$2 \times 5 = \square$	$4008 - 2161 = \square$	$24 + 36 + 57 = \square$

Using Division and Multiplication in Solving Problems

In some of the problems on this page you are to think of groups of equal size as being put together. Then you will multiply the numbers. In some problems you will rearrange the objects in one group into smaller groups of equal size. Then divide the numbers.

Oral Read. Tell how you would solve each problem. Then tell why you decided as you did.

1. John put 20 model airplanes in a display cabinet. He put 4 airplanes on each shelf. How many shelves did he use? $20 \div 4 = \square$ 5 shelves Divide; find the number of groups of equal size
2. Dick needs 5 boards to make a box. How many boxes can he make from 25 boards? $25 \div 5 = \square$ 5 boxes Divide; find the number of groups of equal size
3. If chairs are arranged in 5 rows with 6 seats in a row, how many chairs are there in all? $5 \times 6 = \square$ 30 chairs Multiply; put together groups of equal size
4. 32 children are to march in 4 columns with the same number of children in each column. How many children are to be in each column? $32 \div 4 = \square$ 8 children Divide; find the number of groups of equal size
5. Bob pasted 9 baseball pictures on each page of his scrapbook. He had enough pictures to fill 4 pages. How many pictures did he have? $4 \times 9 = \square$ 36 pictures Multiply; put together groups of equal size
6. 20 boys were put into teams with 5 players on a team. How many teams were made? $20 \div 5 = \square$ 4 teams Divide; find the number of groups of equal size

Written Write the arithmetic statement you will use to solve each problem above. Find the missing number. Read the problem again to see whether your answer is sensible. Write the answer. See above.

Using 6 as a Divisor

÷	1	2	3	4	5	6	7	8	9
1	1	2	3	4	5	6	7	8	9
2	2	4	6	8	10	12	14	16	18
3	3	6	9	12	15	18	21	24	27
4	4	8	12	16	20	24	28	32	36
5	5	10	15	20	25	30	35	40	45
6	6	12	18	24	30	36			
7	7	14	21	28	35				
8	8	16	24	32	40				
9	9	18	27	36	45				

Look at the table at the left. The strips will help you discover how many 6's are contained in 30. $30 \div 6 = \square$. Does $5 \times 6 = 30$? Does $30 \div 6 = 5$?

Use the table to show that the products and quotients in these multiplications and divisions are correct.

$$1 \times 6 = 6$$

$$6 \div 6 = 1$$

$$3 \times 6 = 18$$

$$18 \div 6 = 3$$

$$2 \times 6 = 12$$

$$12 \div 6 = 2$$

$$4 \times 6 = 24$$

$$24 \div 6 = 4$$

Oral Read. Tell each product or quotient.

- | | <i>a</i> | <i>b</i> | <i>c</i> | <i>d</i> |
|----|--------------------------------------|------------------------------------|--------------------------------------|------------------------------------|
| 1. | $9 \times 5 = \square$ ⁴⁵ | $45 \div 5 = \square$ ⁹ | $5 \times 6 = \square$ ³⁰ | $30 \div 6 = \square$ ⁵ |
| 2. | $3 \times 6 = \square$ ¹⁸ | $18 \div 6 = \square$ ³ | $5 \times 5 = \square$ ²⁵ | $25 \div 5 = \square$ ⁵ |
| 3. | $6 \times 6 = \square$ ³⁶ | $36 \div 6 = \square$ ⁶ | $4 \times 6 = \square$ ²⁴ | $24 \div 6 = \square$ ⁴ |
| 4. | $2 \times 6 = \square$ ¹² | $12 \div 6 = \square$ ² | $1 \times 6 = \square$ ⁶ | $6 \div 6 = \square$ ¹ |
| 5. | $3 \times 4 = \square$ ¹² | $12 \div 4 = \square$ ³ | $8 \times 5 = \square$ ⁴⁰ | $40 \div 5 = \square$ ⁸ |
| 6. | $6 \times 4 = \square$ ²⁴ | $24 \div 4 = \square$ ⁶ | $4 \times 0 = \square$ ⁰ | $0 \div 4 = \square$ ⁰ |

Written Copy rows 1 through 6. Replace each \square with the correct numeral. See above.

Using 7 as a Divisor

Look at the table on page 248. Use the table to show that the products and quotients in these matching multiplications and divisions are correct.

$1 \times 7 = 7$	$7 \div 7 = 1$	$2 \times 7 = 14$	$14 \div 7 = 2$
$3 \times 7 = 21$	$21 \div 7 = 3$	$5 \times 7 = 35$	$35 \div 7 = 5$

You have already seen that division is the inverse operation of multiplication. Now notice that the reverse is also true. Multiplication is the inverse operation of division and can be used to undo division as shown. Thus, to check division, see if *quotient times divisor equals dividend*. How would you check $27 \div 3 = 9$?

$$35 \div 5 = 7 \text{ Divide}$$

$$5 \times 7 = 35 \text{ Check}$$

Oral Read. Tell each quotient. Then tell how you would check each division. See examples above.

$$14 \div 7 = \square \quad \begin{matrix} a \\ 2 \end{matrix}$$

$$35 \div 7 = \square \quad \begin{matrix} b \\ 5 \end{matrix}$$

$$28 \div 7 = \square \quad \begin{matrix} c \\ 4 \end{matrix}$$

$$21 \div 7 = \square \quad \begin{matrix} d \\ 3 \end{matrix}$$

Written Copy. Write each quotient. Check.

$\begin{matrix} a \\ 2 \\ 2 \overline{)4} \end{matrix}$	$\begin{matrix} b \\ 2 \\ 7 \overline{)14} \end{matrix}$	$\begin{matrix} c \\ 4 \\ 5 \overline{)20} \end{matrix}$	$\begin{matrix} d \\ 3 \\ 2 \overline{)6} \end{matrix}$	$\begin{matrix} e \\ 5 \\ 6 \overline{)30} \end{matrix}$	$\begin{matrix} f \\ 1 \\ 6 \overline{)6} \end{matrix}$
$\begin{matrix} 1 \\ 1 \\ 3 \overline{)3} \end{matrix}$	$\begin{matrix} 4 \\ 6 \overline{)24} \end{matrix}$	$\begin{matrix} 3 \\ 4 \overline{)12} \end{matrix}$	$\begin{matrix} 9 \\ 3 \overline{)27} \end{matrix}$	$\begin{matrix} 3 \\ 7 \overline{)21} \end{matrix}$	$\begin{matrix} 2 \\ 5 \overline{)10} \end{matrix}$
$\begin{matrix} 4 \\ 4 \\ 4 \overline{)16} \end{matrix}$	$\begin{matrix} 3 \\ 5 \overline{)15} \end{matrix}$	$\begin{matrix} 1 \\ 5 \overline{)5} \end{matrix}$	$\begin{matrix} 5 \\ 7 \overline{)35} \end{matrix}$	$\begin{matrix} 5 \\ 4 \overline{)20} \end{matrix}$	$\begin{matrix} 2 \\ 6 \overline{)12} \end{matrix}$
$\begin{matrix} 4 \\ 7 \overline{)28} \end{matrix}$	$\begin{matrix} 3 \\ 3 \overline{)9} \end{matrix}$	$\begin{matrix} 3 \\ 6 \overline{)18} \end{matrix}$	$\begin{matrix} 9 \\ 4 \overline{)36} \end{matrix}$	$\begin{matrix} 1 \\ 7 \overline{)7} \end{matrix}$	$\begin{matrix} 6 \\ 2 \overline{)12} \end{matrix}$

÷	1	2	3	4	5	6	7	8	9
1	1	2	3	4	5	6	7	8	9
2	2	4	6	8	10	12	14	16	18
3	3	6	9	12	15	18	21	24	27
4	4	8	12	16	20	24	28	32	36
5	5	10	15	20	25	30	35	40	45
6	6	12	18	24	30	36			
7	7	14	21	28	35				
8	8	16	24	32	40				
9	9	18	27	36	45				

Using 8 and 9 as Divisors

Use the table at the left to find the quotients when you divide 8 by 8, 16 by 8, 24 by 8, 32 by 8, and 40 by 8. Also use the table to find the quotients when you divide 9 by 9, 18 by 9, 27 by 9, 36 by 9, and 45 by 9.

Oral Read. Replace each \square with the correct numeral.

- | | | | |
|---|--|--|---|
| <p><i>a</i></p> <p>1. $16 \div 8 = \square$</p> <p>2. $18 \div 9 = \square$</p> <p>3. $\square \div 8 = 4$</p> <p>4. $8 \div \square = 1$</p> <p>5. $36 \div 9 = \square$</p> <p>6. $16 \div \square = 2$</p> <p>7. $\square \div 8 = 5$</p> <p>8. $\square \div 9 = 5$</p> | <p><i>b</i></p> <p>$32 \div \square = 4$</p> <p>$0 \div 8 = \square$</p> <p>$\square \div 9 = 2$</p> <p>$9 \div \square = 1$</p> <p>$32 \div 8 = \square$</p> <p>$\square \div 9 = 3$</p> <p>$24 \div \square = 3$</p> <p>$\square \div 9 = 4$</p> | <p><i>c</i></p> <p>$24 \div 8 = \square$</p> <p>$18 \div \square = 2$</p> <p>$27 \div \square = 3$</p> <p>$40 \div \square = 5$</p> <p>$\square \div 8 = 1$</p> <p>$45 \div 9 = \square$</p> <p>$40 \div 8 = \square$</p> <p>$45 \div \square = 5$</p> | <p><i>d</i></p> <p>$0 \div 9 = \square$</p> <p>$27 \div 9 = \square$</p> <p>$\square \div 8 = 3$</p> <p>$\square \div 9 = 1$</p> <p>$36 \div \square = 4$</p> <p>$\square \div 8 = 2$</p> <p>$45 \div \square = 9$</p> <p>$32 \div \square = 4$</p> |
|---|--|--|---|

Written Copy rows 1 through 8. Replace each \square with the correct numeral. See above.

Something to do Make practice cards for divisions with divisors of 1 through 9. Study them.

$$\begin{array}{r} 8 \overline{) 32} \end{array}$$

FRONT

$$\begin{array}{r} 4 \\ 8 \overline{) 32} \end{array}$$

BACK

Practicing Division

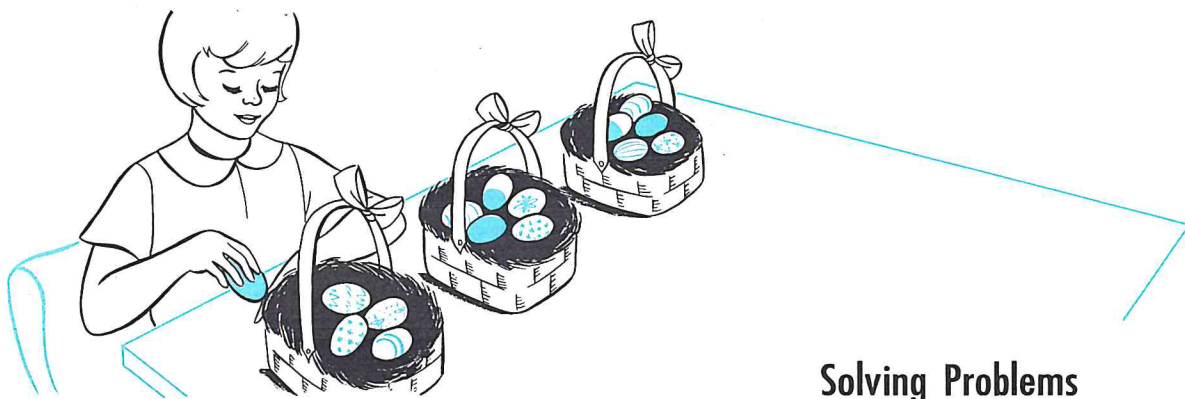
You should be able to do this page by yourself.

Oral Read. Tell each quotient.

a	b	c	d	e	f
1. $7 \overline{)35}$ $\begin{array}{r} 5 \\ 7 \times 5 = 35 \\ \hline \end{array}$	$9 \overline{)18}$ $\begin{array}{r} 2 \\ 9 \times 2 = 18 \\ \hline \end{array}$	$4 \overline{)36}$ $\begin{array}{r} 9 \\ 4 \times 9 = 36 \\ \hline \end{array}$	$8 \overline{)16}$ $\begin{array}{r} 2 \\ 8 \times 2 = 16 \\ \hline \end{array}$	$6 \overline{)12}$ $\begin{array}{r} 2 \\ 6 \times 2 = 12 \\ \hline \end{array}$	$5 \overline{)30}$ $\begin{array}{r} 6 \\ 5 \times 6 = 30 \\ \hline \end{array}$
2. $4 \overline{)32}$ $\begin{array}{r} 8 \\ 4 \times 8 = 32 \\ \hline \end{array}$	$3 \overline{)27}$ $\begin{array}{r} 9 \\ 3 \times 9 = 27 \\ \hline \end{array}$	$9 \overline{)27}$ $\begin{array}{r} 3 \\ 9 \times 3 = 27 \\ \hline \end{array}$	$4 \overline{)28}$ $\begin{array}{r} 7 \\ 4 \times 7 = 28 \\ \hline \end{array}$	$3 \overline{)21}$ $\begin{array}{r} 7 \\ 3 \times 7 = 21 \\ \hline \end{array}$	$4 \overline{)24}$ $\begin{array}{r} 6 \\ 4 \times 6 = 24 \\ \hline \end{array}$
3. $8 \overline{)24}$ $\begin{array}{r} 3 \\ 8 \times 3 = 24 \\ \hline \end{array}$	$5 \overline{)35}$ $\begin{array}{r} 7 \\ 5 \times 7 = 35 \\ \hline \end{array}$	$5 \overline{)15}$ $\begin{array}{r} 3 \\ 5 \times 3 = 15 \\ \hline \end{array}$	$6 \overline{)36}$ $\begin{array}{r} 6 \\ 6 \times 6 = 36 \\ \hline \end{array}$	$6 \overline{)42}$ $\begin{array}{r} 7 \\ 6 \times 7 = 42 \\ \hline \end{array}$	$2 \overline{)18}$ $\begin{array}{r} 9 \\ 2 \times 9 = 18 \\ \hline \end{array}$
4. $3 \overline{)24}$ $\begin{array}{r} 8 \\ 3 \times 8 = 24 \\ \hline \end{array}$	$6 \overline{)18}$ $\begin{array}{r} 3 \\ 6 \times 3 = 18 \\ \hline \end{array}$	$8 \overline{)32}$ $\begin{array}{r} 4 \\ 8 \times 4 = 32 \\ \hline \end{array}$	$5 \overline{)20}$ $\begin{array}{r} 4 \\ 5 \times 4 = 20 \\ \hline \end{array}$	$3 \overline{)18}$ $\begin{array}{r} 6 \\ 3 \times 6 = 18 \\ \hline \end{array}$	$4 \overline{)20}$ $\begin{array}{r} 5 \\ 4 \times 5 = 20 \\ \hline \end{array}$
5. $9 \overline{)45}$ $\begin{array}{r} 5 \\ 9 \times 5 = 45 \\ \hline \end{array}$	$9 \overline{)36}$ $\begin{array}{r} 4 \\ 9 \times 4 = 36 \\ \hline \end{array}$	$6 \overline{)30}$ $\begin{array}{r} 5 \\ 6 \times 5 = 30 \\ \hline \end{array}$	$7 \overline{)28}$ $\begin{array}{r} 4 \\ 7 \times 4 = 28 \\ \hline \end{array}$	$5 \overline{)45}$ $\begin{array}{r} 9 \\ 5 \times 9 = 45 \\ \hline \end{array}$	$7 \overline{)21}$ $\begin{array}{r} 3 \\ 7 \times 3 = 21 \\ \hline \end{array}$

Written Copy. Replace each \square with a numeral. Check each division by using multiplication.

a	b	c	d
1. $40 \div 8 = \square$ $\begin{array}{r} 5 \\ 8 \times 5 = 40 \end{array}$	$\square \div 6 = 1$ $\begin{array}{r} 6 \\ 6 \times 1 = 6 \end{array}$	$27 \div 3 = \square$ $\begin{array}{r} 9 \\ 3 \times 9 = 27 \end{array}$	$18 \div \square = 3$ $\begin{array}{r} 6 \\ 6 \times 3 = 18 \end{array}$
2. $35 \div 5 = \square$ $\begin{array}{r} 7 \\ 5 \times 7 = 35 \end{array}$	$16 \div 4 = \square$ $\begin{array}{r} 4 \\ 4 \times 4 = 16 \end{array}$	$\square \div 3 = 5$ $\begin{array}{r} 15 \\ 3 \times 5 = 15 \end{array}$	$15 \div 3 = \square$ $\begin{array}{r} 5 \\ 3 \times 5 = 15 \end{array}$
3. $15 \div \square = 3$ $\begin{array}{r} 5 \\ 3 \times 5 = 15 \end{array}$	$45 \div \square = 9$ $\begin{array}{r} 5 \\ 9 \times 5 = 45 \end{array}$	$\square \div 7 = 2$ $\begin{array}{r} 14 \\ 7 \times 2 = 14 \end{array}$	$\square \div 4 = 2$ $\begin{array}{r} 8 \\ 4 \times 2 = 8 \end{array}$
4. $21 \div \square = 3$ $\begin{array}{r} 7 \\ 3 \times 7 = 21 \end{array}$	$10 \div \square = 5$ $\begin{array}{r} 2 \\ 5 \times 2 = 10 \end{array}$	$6 \div \square = 2$ $\begin{array}{r} 3 \\ 2 \times 3 = 6 \end{array}$	$18 \div \square = 2$ $\begin{array}{r} 9 \\ 2 \times 9 = 18 \end{array}$
5. $18 \div 9 = \square$ $\begin{array}{r} 2 \\ 9 \times 2 = 18 \end{array}$	$20 \div \square = 5$ $\begin{array}{r} 4 \\ 5 \times 4 = 20 \end{array}$	$\square \div 5 = 9$ $\begin{array}{r} 45 \\ 5 \times 9 = 45 \end{array}$	$20 \div 5 = \square$ $\begin{array}{r} 4 \\ 5 \times 4 = 20 \end{array}$
6. $\square \div 8 = 3$ $\begin{array}{r} 24 \\ 8 \times 3 = 24 \end{array}$	$32 \div \square = 4$ $\begin{array}{r} 8 \\ 4 \times 8 = 32 \end{array}$	$\square \div 4 = 3$ $\begin{array}{r} 12 \\ 4 \times 3 = 12 \end{array}$	$\square \div 7 = 4$ $\begin{array}{r} 28 \\ 7 \times 4 = 28 \end{array}$
7. $8 \div \square = 1$ $\begin{array}{r} 8 \\ 1 \times 8 = 8 \end{array}$	$16 \div 8 = \square$ $\begin{array}{r} 2 \\ 8 \times 2 = 16 \end{array}$	$12 \div \square = 2$ $\begin{array}{r} 6 \\ 2 \times 6 = 12 \end{array}$	$\square \div 4 = 9$ $\begin{array}{r} 36 \\ 4 \times 9 = 36 \end{array}$
8. $30 \div \square = 5$ $\begin{array}{r} 6 \\ 5 \times 6 = 30 \end{array}$	$40 \div 5 = \square$ $\begin{array}{r} 8 \\ 5 \times 8 = 40 \end{array}$	$\square \div 4 = 2$ $\begin{array}{r} 8 \\ 4 \times 2 = 8 \end{array}$	$\square \div 3 = 3$ $\begin{array}{r} 9 \\ 3 \times 3 = 9 \end{array}$
9. $12 \div \square = 4$ $\begin{array}{r} 3 \\ 4 \times 3 = 12 \end{array}$	$7 \div 7 = \square$ $\begin{array}{r} 1 \\ 7 \times 1 = 7 \end{array}$	$25 \div \square = 5$ $\begin{array}{r} 5 \\ 5 \times 5 = 25 \end{array}$	$10 \div 5 = \square$ $\begin{array}{r} 2 \\ 5 \times 2 = 10 \end{array}$
10. $30 \div \square = 6$ $\begin{array}{r} 5 \\ 6 \times 5 = 30 \end{array}$	$24 \div 6 = \square$ $\begin{array}{r} 4 \\ 6 \times 4 = 24 \end{array}$	$35 \div 5 = \square$ $\begin{array}{r} 7 \\ 5 \times 7 = 35 \end{array}$	$35 \div 7 = \square$ $\begin{array}{r} 5 \\ 7 \times 5 = 35 \end{array}$



Solving Problems

Oral Read each problem carefully. Tell what arithmetic statement you would use to solve it.

1. Julie had 15 Easter eggs to put in 3 baskets. She put the same number of eggs in each basket. How many eggs were in each basket? $15 \div 3 = \square$ 5 eggs
2. Mrs. Brown gave 4 apples each to 6 boys. How many apples in all did she give to the boys? $6 \times 4 = \square$ 24 apples
3. There were 2297 people at the school basketball game one Saturday. The next Saturday 3162 people came to the game. How many more people attended the second game than the first? $3162 - 2297 = \square$ 865 people
4. 32 children were at a party. 4 children were to sit at each table. How many tables were needed? $32 \div 4 = \square$ 8 tables
5. The new school library received 1476 books from the city library. The P.T.A. donated 2764 more books and the children collected 578. How many books in all were in the new library? $1476 + 2764 + 578 = \square$ 4818 books

Written Write the arithmetic statement for each problem above. Find the missing number. Read the problem again to see if your answer is sensible. Write your answer. See above.

Because the procedure in using this page parallels that of previous pages of *Checkup Time* (see T181 or T161), no page T253 is included.

Checkup Time

The numerals in () tell the pages where you can turn for help if you need it.

Important Ideas

1. You can arrange a group of objects into smaller groups of equal size by dividing. (236)

2. You can use repeated subtraction to find the quotient in a division. (239)

3. You can use multiplication to check a division. (249)

Words to Know

1. Divided by, \div , $\overline{)}$ (236)

2. Dividend (236)

3. Divisor (236)

4. Quotient (236)

Questions to Discuss

See below.

1. What name is given to each of the numbers in the divisions at the right? (236)

$$\begin{array}{r} 8 \div 2 = 4 \\ 3 \overline{)6} \end{array}$$

2. In $6 \div 1 = 6$, why is the quotient the same as the dividend? (238)

1. 8 is the dividend, 2 is the divisor, 4 is the quotient; 6 is the dividend, 3 is the divisor, 2 is the quotient
2. Where the divisor is 1, the quotient is the same as the dividend
3. Division is a short form of repeated subtraction
4. Multiply the quotient by the divisor

3. How can repeated subtraction help you find the quotient in a division? (239)

4. How do you check a division? (249)

Oral Practice

Tell how you would solve each problem. (242, 247) Use **division**.

1. Betty had 12 lollipops. She gave them to 4 of her friends. Each friend received the same number of lollipops. How many did each receive? $12 \div 4 = \square$

3 lollipops

2. For Richard's party, his mother made 18 sandwiches. Each boy ate 3. How many boys were at the party? $18 \div 3 = \square$ **6 boys**

Written Practice

Copy. Replace each \square with a numeral. (239)

$$1. \begin{array}{c} 1 \\ \square \end{array} \times 2 = 2$$

$$2. \begin{array}{c} 2 \\ \square \end{array} \times 3 = 6$$

$$b \quad 2 \div 1 = \begin{array}{c} 2 \\ \square \end{array}$$

$$6 \div 2 = \begin{array}{c} 3 \\ \square \end{array}$$

Self-Evaluation

Part 1 Copy. Write each sum or difference.

	<i>a</i>	<i>b</i>	<i>c</i>
1.	$\begin{array}{r} 65 \\ 38 \\ 87 \\ +49 \\ \hline 239 \end{array}$	$\begin{array}{r} 497 \\ 84 \\ 96 \\ +307 \\ \hline 984 \end{array}$	$\begin{array}{r} 680 \\ 221 \\ 273 \\ +99 \\ \hline 1273 \end{array}$
2.	$\begin{array}{r} 2496 \\ 384 \\ 4275 \\ +36 \\ \hline 7191 \end{array}$	$\begin{array}{r} 3742 \\ 631 \\ 1475 \\ +847 \\ \hline 6695 \end{array}$	$\begin{array}{r} 4045 \\ 628 \\ 791 \\ +5070 \\ \hline 10534 \end{array}$
3.	$\begin{array}{r} 5200 \\ -3741 \\ \hline 1459 \end{array}$	$\begin{array}{r} 7124 \\ -2418 \\ \hline 4706 \end{array}$	$\begin{array}{r} 9700 \\ -3526 \\ \hline 6174 \end{array}$

Part 2 Copy. Replace each \square with a numeral.

	<i>a</i>	<i>b</i>
1.	$\square \times 4 = 4$	$\square \times 2 = 6$
2.	$3 \times 3 = \square$	$3 \times 4 = \square$
3.	$2 \times \square = 10$	$2 \times \square = 12$

Part 3 Copy. Write each quotient.

	<i>a</i>	<i>b</i>	<i>c</i>
1.	$4 \overline{)16}$	$5 \overline{)40}$	$3 \overline{)12}$
2.	$8 \overline{)24}$	$6 \overline{)30}$	$6 \overline{)6}$
3.	$7 \overline{)28}$	$1 \overline{)5}$	$9 \overline{)45}$
4.	$5 \overline{)25}$	$6 \overline{)30}$	$4 \overline{)24}$

Part 4 Write each problem in the language of arithmetic and solve it.

1. There are 374 girls and 389 boys in Byrd School. How many pupils are there in the school?

$$374 + 389 = \square \quad 763 \text{ pupils}$$

2. Jerry caught 7 fish, Tom caught 9, and Joe caught 5. How many fish were caught?

$$7 + 9 + 5 = \square \quad 21 \text{ fish}$$

3. Two boys set up 36 chairs, with 9 chairs in each row. How many rows of chairs were there?

$$36 \div 9 = \square \quad 4 \text{ rows}$$

4. On a trip, Dan and his father drove 276 miles the first day, 364 the second, and 179 the third. How many miles did they drive in those three days?

$$276 + 364 + 179 = \square \quad 819 \text{ miles}$$

5. How many pencils are there in 4 boxes if there are 2 pencils in each of the boxes?

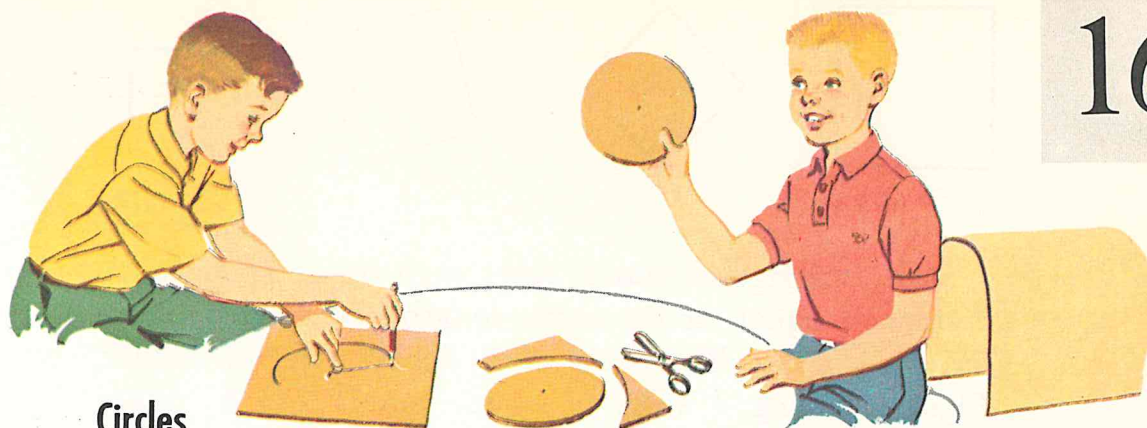
$$2 \times 4 = \square \quad 8 \text{ pencils}$$

6. Joan has 20 storybook dolls. She put 5 on each shelf. How many shelves did she use?

$$20 \div 5 = \square \quad 4 \text{ shelves}$$

7. Jim used 4 stamps on each of 6 letters he had written. How many stamps did he use?

$$6 \times 4 = \square \quad 24 \text{ stamps}$$



Circles

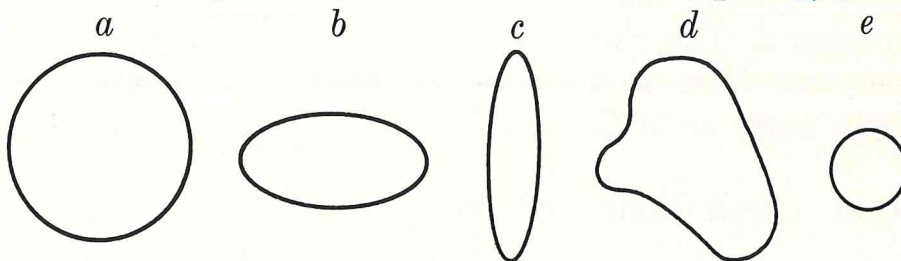
What do you think John is doing? He is going to draw a line which he can follow as he cuts out another wheel.

A figure such as the one John is making is called a **circle**. The point marked by the thumbtack is called the **center of the circle**.

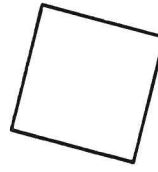
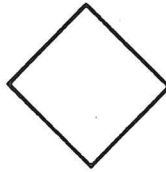
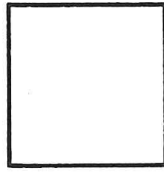
Objects having the shape of the figure John is making are called **circular**. Is a penny circular? Is a bicycle wheel circular?

Oral Answer these questions.

1. What would have happened to the size of John's circle if he had cut a shorter string? A longer string?
Smaller circle; larger circle
2. Which figures below have a circular shape? **a; e**



Something to do Make circles of your own using the plan that John used.



Squares

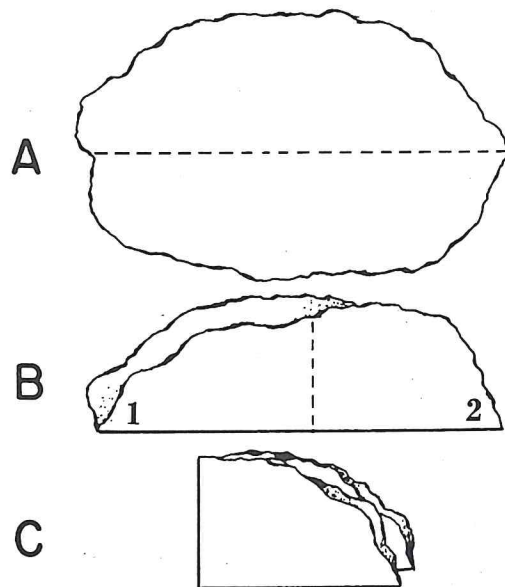
Study the figures above. Does each figure above have 4 sides of equal, or the same, length? Does each figure have 4 corners like those of a door or windowpane? Figures having 4 sides of equal length and 4 square corners are called **squares**.

Corners such as those of a door or windowpane are called **right angles**. You can make a right angle as shown below.

Step 1: Take a piece of paper of any shape as in A.

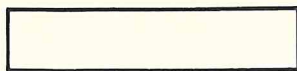
Step 2: Fold it over along any line like the dotted line in figure A.

Step 3: Fold the paper again so that 1 touches 2. The corner you form is a right angle as in C.

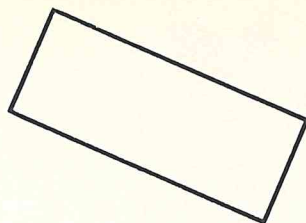


Oral Read, think, and do.

1. Do all right angles look alike? **Yes**
2. Use a ruler and paper as above. Draw a square.



A



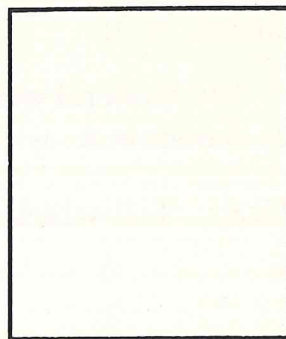
Rectangles and Triangles

Study the figures above. Are they squares? Why or why not? Each figure above has 4 right angles, but the 4 sides are not of equal length so they are not squares.








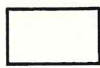
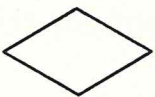
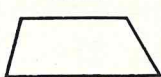
Take a piece of paper with a straight edge. Place it along the top line of figure A. Place marks on it to show the length of the top line. Is the bottom line of A the same length? Are the two sides of figure A equal in length?

Figures with opposite sides that are equal in length, and with square corners are called **rectangles**.

Draw a line from one corner to the opposite corner of a rectangle or square as at the right. Cut along the line you drew. You will have 2 parts of equal size. Each part is a **triangle**. Any shape having 3 sides and 3 angles is called a triangle.



Oral Tell which figures below have the shape of a circle. A square. A rectangle. A triangle.

	circle	rectangle	triangle		rectangle
	a	b	c	d	e
1.					
2.					
	rectangle	circle	rectangle		



The Fraction One Half

Bob is sawing 1 board into 2 equal pieces. He can give the number name **one half** to each of the pieces. One half is a **fractional number**.

The numeral for the fractional number *one half* is shown in A. Such numerals as $\frac{1}{2}$, $\frac{2}{2}$, $\frac{1}{3}$, and $\frac{2}{3}$ are called **fractions**.

A $\frac{1}{2}$

Each fraction has three parts as shown in B.

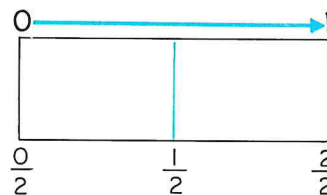
B 1 A numeral
— A fraction line
2 A numeral

Any numeral written in three parts, as shown in A, is called a fraction.

Oral Tell which of the following are fractions. **a, c, e**

<i>a</i>	<i>b</i>	<i>c</i>	<i>d</i>	<i>e</i>	<i>f</i>
$\frac{0}{2}$	3	$\frac{1}{2}$	1	$\frac{2}{2}$	2

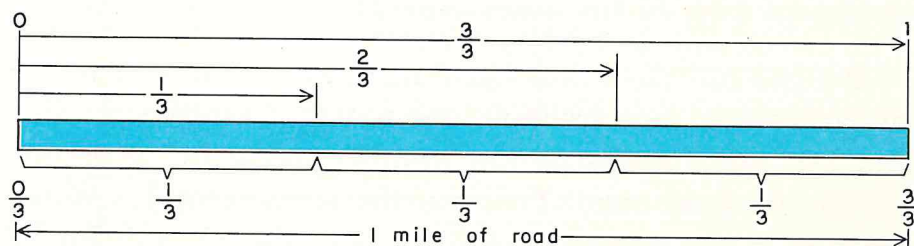
Something to do Draw a line any length you wish. Cut a narrow strip of paper the exact length of your line. Fold the strip of paper into two equal lengths. Open the strip and mark the fold. Lay the strip under your line. Does $\frac{1}{2}$ equal 1 divided into 2 equal parts? Do you see that $\frac{1}{2}$ is 1 divided by 2?



Using Thirds

Suppose you cut a piece of paper into three pieces of equal size and wanted to give each piece a number name. To show that you were thinking of 1 of the 3 pieces, you could use the name **one third**. As a fraction, one third is written: $\frac{1}{3}$.

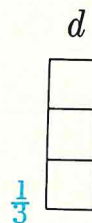
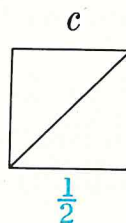
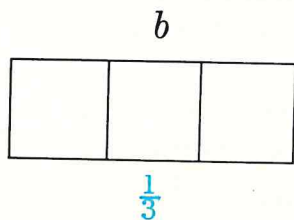
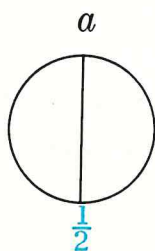
The diagram below may help you understand the meaning of a fraction.



Now make believe that the blue part of the diagram shown above is a road. Where is the beginning point? The end point? The brackets below the road are used to show the distances between stops.

Look at the arrows above. What fractional part of the distance would you go before making the first stop? The second stop? The third stop? Do you see that $\frac{3}{3}$ is the whole distance?

Oral Tell which fraction you would use in naming each fractional part of the figures below.



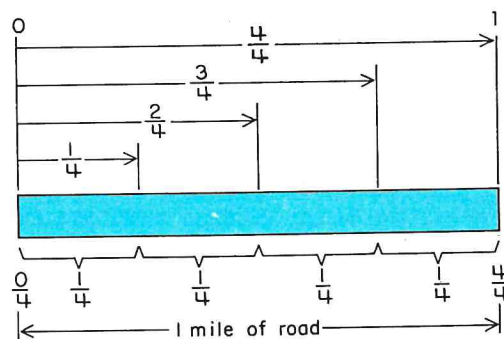


Using Fourths

Betsy cut 4 pieces of paper. Is each of the pieces equal in size to each of the other pieces?

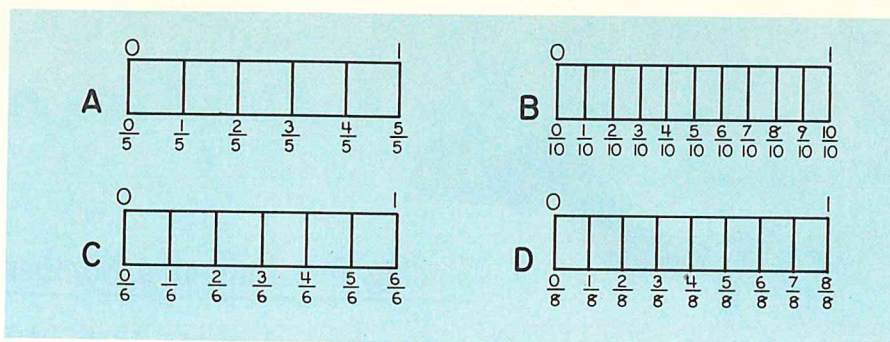
She can use the words **one fourth** as the number name of each piece. As a fraction, one fourth is written: $\frac{1}{4}$. She can use **two fourths** as the number name for 2 of the pieces of equal size. Two fourths is written: $\frac{2}{4}$. What fraction is the number name for 3 of the pieces? For 4 of the pieces? How would you write the fractions?

Oral The diagram at the right stands for a road. Answer these questions.



1. What fraction marks the beginning point of the road? $\frac{0}{4}$
2. Which part of the distance would you walk in going from 0 to the first mark? To the second mark? To the third mark? To the fourth mark? $\frac{1}{4}$, $\frac{2}{4}$, $\frac{3}{4}$, $\frac{4}{4}$

Something to do Draw 3 lines any length you wish. Mark off 1 line in halves, another in thirds, and another in fourths. Label each part $\frac{1}{2}$, $\frac{1}{3}$, or $\frac{1}{4}$.



Using Fifths, Sixths, Eighths, and Tenths

Look at the diagrams above. How many parts of equal size do you see in A? In B? In C? In D?

Which fraction names 1 of 5 parts of equal size? 1 of 10 parts of equal size? 1 of 6 parts of equal size? 1 of 8 parts of equal size?

Oral Answer these questions.

- Which is longer, $\frac{1}{5}$ or $\frac{1}{10}$ of the same line? $\frac{1}{5}$
- Which is longer, $\frac{1}{6}$ or $\frac{1}{8}$ of the same line? $\frac{1}{6}$

Written Write the following as fractions.

- | <i>a</i> | <i>b</i> | <i>c</i> |
|--------------------------------|-----------------------------|-----------------------------|
| 1. two fifths $\frac{2}{5}$ | three fifths $\frac{3}{5}$ | four fifths $\frac{4}{5}$ |
| 2. three tenths $\frac{3}{10}$ | six tenths $\frac{6}{10}$ | nine tenths $\frac{9}{10}$ |
| 3. one eighth $\frac{1}{8}$ | three eighths $\frac{3}{8}$ | seven eighths $\frac{7}{8}$ |
| 4. five sixths $\frac{5}{6}$ | one sixth $\frac{1}{6}$ | four sixths $\frac{4}{6}$ |

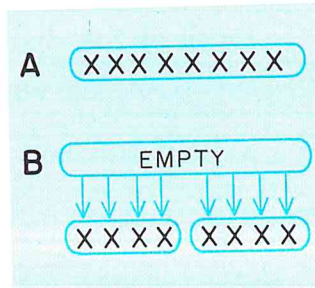
Something to do Take two narrow strips of paper, each 10 inches long. Cut one strip into 5 pieces of equal length. Cut the other into 10 equal lengths. Write the correct fraction on each piece.



Finding One Half of a Number

Dick had 8 peanuts. He gave $\frac{1}{2}$ of them to Jack and kept the rest. How many peanuts did he give away?

To solve the problem you must separate a set of 8 objects into 2 groups of equal size. The original set must be empty.



Look at the picture. How many peanuts were in the original set? How many peanuts are in each of the 2 smaller groups? Does $\frac{1}{2}$ of 8 = 4? Does $8 \div 2 = 4$? To find $\frac{1}{2}$ of a number, you divide the number by 2.

Oral Answer each question below.

1. What diagram can you draw to show that $\frac{1}{2}$ of 6 is equal to 3? *See above.*
2. What is the value of $\frac{1}{2}$ of 4? Of $\frac{1}{2}$ of 10? *2; 5*

Written Copy. Replace each with a numeral.

a
1. $\frac{1}{2}$ of 12 = 6

2. $\frac{1}{2}$ of 18 = 9

3. $\frac{1}{2}$ of 6 = 3

4. $\frac{1}{2}$ ft. = 6 in.

b
 $\frac{1}{2}$ of 2 = 1

$\frac{1}{2}$ of 16 = 8

$\frac{1}{2}$ of 10 = 5

$\frac{1}{2}$ qt. = 1 pt.

c
 $\frac{1}{2}$ of 4 = 2

$\frac{1}{2}$ of 14 = 7

$\frac{1}{2}$ of 8 = 4

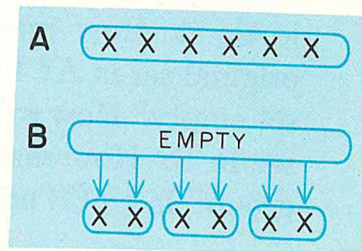
$\frac{1}{2}$ gal. = 2 qt.

Finding One Third of a Number

Ann bought 6 balloons. $\frac{1}{3}$ of them were blue. How many balloons were blue?

To solve the problem you must separate a set of 6 balloons into 3 groups of equal size. A and B show how to find $\frac{1}{3}$ of 6.

In A you see X's to stand for all of the balloons. In B, the X's are separated into 3 groups. Is the original set empty? Is $\frac{1}{3}$ of 6 equal to 2?



To find $\frac{1}{3}$ of 6, divide 6 by 3. Is 6 divided by 3 equal to 2? 2 of Ann's balloons were blue. To find $\frac{1}{3}$ of a number, you divide the number by 3.

Oral Answer each question below.

1. What would you do to find $\frac{1}{3}$ of 9? $\frac{1}{3}$ of 12? **Divide by 3**
2. What would you do to find $\frac{1}{3}$ of any number? **Divide by 3**

Written Copy. Replace each with a numeral.

- | <i>a</i> | <i>b</i> | <i>c</i> |
|-----------------------------------|--------------------------------|--------------------------------|
| 1. $\frac{1}{3}$ of 6 = <u>2</u> | $\frac{1}{3}$ of 3 = <u>1</u> | $\frac{1}{3}$ of 12 = <u>4</u> |
| 2. $\frac{1}{3}$ of 18 = <u>6</u> | $\frac{1}{3}$ of 27 = <u>9</u> | $\frac{1}{3}$ of 21 = <u>7</u> |
| 3. $\frac{1}{3}$ of 15 = <u>5</u> | $\frac{1}{3}$ of 9 = <u>3</u> | $\frac{1}{3}$ of 24 = <u>8</u> |

Can you do this? Solve this problem.

Carol had 15 pieces of candy. She put $\frac{1}{3}$ of them on each of 3 dishes. How many pieces did she put on each dish?
 $15 \div 3 = \square$ **5 pieces**

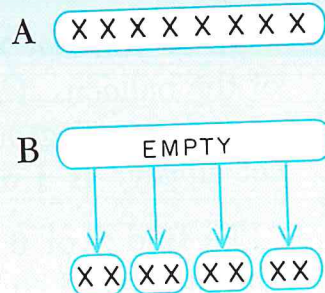
MORE PRACTICE

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Finding One Fourth of a Number

Suppose you want to answer the question: "How much is $\frac{1}{4}$ of 8?"

To answer the question, you can separate a set of 8 objects into 4 groups of equal size, leaving the original set empty. The diagrams show how to do it. How many X's are in the original set in A? In B, is the original set empty? How many groups do you see in B? How many X's are in each group? Is $\frac{1}{4}$ of 8 equal to $8 \div 4$?



To find $\frac{1}{4}$ of a number, you divide the number by 4.

Oral Tell what diagram you can make to show that $\frac{1}{4}$ of 12 is equal to 3. *See examples above.*

Written Copy. Replace each with a numeral.

a

1. $\frac{1}{4}$ of 8 = 2

b

$\frac{1}{4}$ of 16 = 4

c

$\frac{1}{4}$ of 12 = 3

2. $\frac{1}{4}$ of 20 = 5

$\frac{1}{4}$ of 24 = 6

$\frac{1}{4}$ of 4 = 1

3. $\frac{1}{4}$ of 36 = 9

$\frac{1}{4}$ of 32 = 8

$\frac{1}{4}$ of 28 = 7

Solve each problem below.

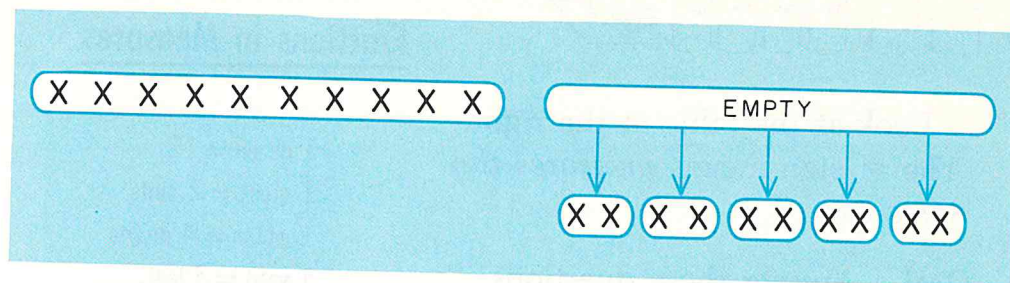
1. How many lollipops are $\frac{1}{4}$ of 24 lollipops? $24 \div 4 = \square$
6 lollipops

2. Sue had 20¢. She spent $\frac{1}{4}$ of it for ice cream. How much did she spend for ice cream? $20 \div 4 = \square$ *5¢*

3. Carl took $\frac{1}{4}$ of 36 new readers to his classroom. How many new readers did he take to his classroom?
 $36 \div 4 = \square$ *9 new readers*

Finding a Fractional Part of a Number

The diagram below shows how to answer the question: "How much is $\frac{1}{5}$ of 10?"



How many X's are in $\frac{1}{5}$ of 10? In $\frac{2}{5}$ of 10? In $\frac{3}{5}$ of 10? Can you find $\frac{1}{5}$ of 10 by dividing 10 by 5? To find $\frac{1}{6}$ of a number, divide the number by 6. Why? By what number would you divide to find $\frac{1}{8}$ of a number? $\frac{1}{10}$ of a number?

Oral Answer each question below.

1. What diagram can you draw to show that $\frac{1}{6}$ of 12 is equal to 2? *See example above.*
2. Which is more, $\frac{1}{6}$ of 24 or $\frac{1}{8}$ of 24? $\frac{1}{5}$ of 40 or $\frac{1}{8}$ of 40? $\frac{1}{5}$ of 20 or $\frac{1}{10}$ of 20? Why? $\frac{1}{6}$; $\frac{1}{5}$; $\frac{1}{5}$; *when the number of parts is less the size of each part is greater*

Written Copy. Replace each — with a numeral. Draw a diagram if you need help.

a
1. $\frac{1}{5}$ of 15 = 3

2. $\frac{1}{6}$ of 12 = 2

3. $\frac{1}{8}$ of 16 = 2

4. $\frac{1}{5}$ of 25 = 5

b
 $\frac{1}{5}$ of 20 = 4

$\frac{1}{6}$ of 18 = 3

$\frac{1}{8}$ of 32 = 4

$\frac{1}{8}$ of 24 = 3

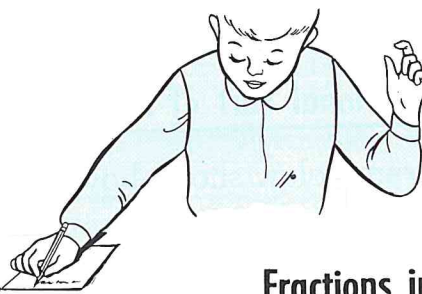
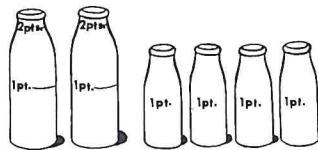
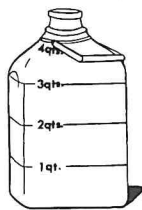
c
 $\frac{1}{5}$ of 10 = 2

$\frac{1}{6}$ of 24 = 4

$\frac{1}{10}$ of 20 = 2

$\frac{1}{10}$ of 30 = 3

MORE PRACTICE
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Fractions in Measures

Look at the table at the right.
The = sign means *measures the same as*.

Oral Answer these questions.

1. How many rolls would be in $\frac{1}{2}$ dozen? **6**

2. How many inches would be in $\frac{1}{4}$ of 1 foot? **3**

Written Copy. Replace each — with a numeral.

- a*
- $\frac{1}{2}$ of 2 pints = **1** pt.
 - $\frac{1}{2}$ of 4 quarts = **2** qt.
 - $\frac{1}{4}$ of 4 qts. = **1** qt.
 - $\frac{1}{3}$ of 12 rolls = **4** rolls
 - $\frac{1}{4}$ of 12 rolls = **3** rolls
 - $\frac{1}{3}$ of 3 feet = **1** ft.
 - $\frac{1}{2}$ of 12 inches = **6** in.
 - $\frac{1}{3}$ of 12 in. = **4** in.
 - $\frac{1}{2}$ of 16 ounces = **8** oz.
 - $\frac{1}{4}$ of 16 oz. = **4** oz.

- b*
- $\frac{1}{2}$ quart = **1** pt.
- $\frac{1}{2}$ gallon = **2** qt.
- $\frac{1}{4}$ gal. = **1** qt.
- $\frac{1}{3}$ dozen = **4**
- $\frac{1}{4}$ doz. = **3**
- $\frac{1}{3}$ yard = **1** ft.
- $\frac{1}{2}$ foot = **6** in.
- $\frac{1}{3}$ ft. = **4** in.
- $\frac{1}{2}$ pound = **8** oz.
- $\frac{1}{4}$ lb. = **4** oz.

Review and Practice

Oral Read. Tell each sum or difference.

$$1. \quad 242 + 36 = \square \quad \begin{array}{r} a \\ 278 \end{array}$$

$$2. \quad 500 - 75 = \square \quad \begin{array}{r} 425 \end{array}$$

$$3. \quad 400 - 392 = \square \quad \begin{array}{r} 8 \end{array}$$

$$4. \quad 7 + 52 + 2 + 6 = \square \quad \begin{array}{r} 67 \end{array}$$

$$471 + 63 = \square \quad \begin{array}{r} b \\ 534 \end{array}$$

$$600 - 95 = \square \quad \begin{array}{r} 505 \end{array}$$

$$621 - 237 = \square \quad \begin{array}{r} 384 \end{array}$$

$$8 + 5 + 4 + 37 = \square \quad \begin{array}{r} 54 \end{array}$$

Read. Tell each product or quotient.

$$1. \quad \begin{array}{r} a \\ 2 \\ \times 4 \\ \hline 8 \end{array}$$

$$\begin{array}{r} b \\ 2 \\ \times 7 \\ \hline 14 \end{array}$$

$$\begin{array}{r} c \\ 5 \\ \times 5 \\ \hline 25 \end{array}$$

$$\begin{array}{r} d \\ 4 \\ \times 9 \\ \hline 36 \end{array}$$

$$2. \quad 2 \overline{)10} \quad \begin{array}{r} 5 \end{array}$$

$$3 \overline{)12} \quad \begin{array}{r} 4 \end{array}$$

$$6 \overline{)18} \quad \begin{array}{r} 3 \end{array}$$

$$5 \overline{)10} \quad \begin{array}{r} 2 \end{array}$$

Written Copy. Write each answer.

$$1. \quad \begin{array}{r} a \\ 8 \\ \times 2 \\ \hline 16 \end{array}$$

$$\begin{array}{r} b \\ 5 \\ \times 3 \\ \hline 15 \end{array}$$

$$\begin{array}{r} c \\ 3 \\ \times 5 \\ \hline 15 \end{array}$$

$$\begin{array}{r} d \\ 4 \\ \times 4 \\ \hline 16 \end{array}$$

$$\begin{array}{r} e \\ 2 \\ \times 8 \\ \hline 16 \end{array}$$

$$2. \quad \begin{array}{r} 9 \\ \times 2 \\ \hline 18 \end{array}$$

$$\begin{array}{r} 2 \\ \times 9 \\ \hline 18 \end{array}$$

$$\begin{array}{r} 6 \\ \times 3 \\ \hline 18 \end{array}$$

$$\begin{array}{r} 3 \\ \times 6 \\ \hline 18 \end{array}$$

$$\begin{array}{r} 4 \\ \times 6 \\ \hline 24 \end{array}$$

$$3. \quad 1 \overline{)2} \quad \begin{array}{r} 2 \end{array}$$

$$3 \overline{)21} \quad \begin{array}{r} 7 \end{array}$$

$$9 \overline{)27} \quad \begin{array}{r} 3 \end{array}$$

$$3 \overline{)24} \quad \begin{array}{r} 8 \end{array}$$

$$7 \overline{)21} \quad \begin{array}{r} 3 \end{array}$$

$$4. \quad \begin{array}{r} 8 \\ 3 \overline{)24} \end{array}$$

$$\begin{array}{r} 8 \\ 2 \overline{)16} \end{array}$$

$$\begin{array}{r} 9 \\ 2 \overline{)18} \end{array}$$

$$\begin{array}{r} 2 \\ 8 \overline{)16} \end{array}$$

$$\begin{array}{r} 2 \\ 9 \overline{)18} \end{array}$$

$$5. \quad \begin{array}{r} 442 \\ +216 \\ \hline 658 \end{array}$$

$$\begin{array}{r} 473 \\ -251 \\ \hline 222 \end{array}$$

$$\begin{array}{r} 3467 \\ +258 \\ \hline 3725 \end{array}$$

$$\begin{array}{r} 2346 \\ +1424 \\ \hline 3770 \end{array}$$

$$\begin{array}{r} 320 \\ -163 \\ \hline 157 \end{array}$$

$$6. \quad \begin{array}{r} 854 \\ 162 \\ +237 \\ \hline 1253 \end{array}$$

$$\begin{array}{r} 3214 \\ 713 \\ +201 \\ \hline 4128 \end{array}$$

$$\begin{array}{r} 2286 \\ 848 \\ +165 \\ \hline 3299 \end{array}$$

$$\begin{array}{r} 2582 \\ 1316 \\ +67 \\ \hline 3965 \end{array}$$

$$\begin{array}{r} 3743 \\ 1265 \\ +58 \\ \hline 5066 \\ 267 \end{array}$$

Solving Problems

You should be able to solve the problems on this page by yourself. First decide whether you are to add, subtract, multiply, or divide.

Written Write each problem in the language of arithmetic and solve it.

1. Paul wants a ball glove that costs \$4.69. He has saved \$3.95. How much more money does he need? *Subtract;*
 $469 - 395 = \square$ \$.74
2. What would be the cost of 5 candy bars that cost 5¢ each? *Multiply;* $5 \times 5 = \square$ 25¢
3. Martha put 24 pieces of candy into a box in 4 equal rows. How many pieces did she put in each row?
Divide; $24 \div 4 = \square$ 6 pieces
4. Monday, Sam's father drove 375 miles. Tuesday, he drove 315 miles. Wednesday, he drove 268 miles. How far did he drive in the three days? *Add;*
 $375 + 315 + 268 = \square$ 958 miles
5. It is 8 blocks from Ann's house to school. Ann has walked $\frac{1}{2}$ of the way. How far has she walked?
Divide; $8 \div 2 = \square$ 4 blocks
6. Mark weighs 76 pounds. His father weighs 156. How much less does Mark weigh than his father?
Subtract; $156 - 76 = \square$ 80 pounds less
7. How many gallon bottles can be filled with 12 quarts of milk? (4 quarts = 1 gallon) *Divide;* $12 \div 4 = \square$ 3 gallon bottles

Can you do this? Make up problems of your own that can be solved by using these statements.

a
1. $20 \div 4 = \square$ 5

2. $3 \times 9 = \square$ 27

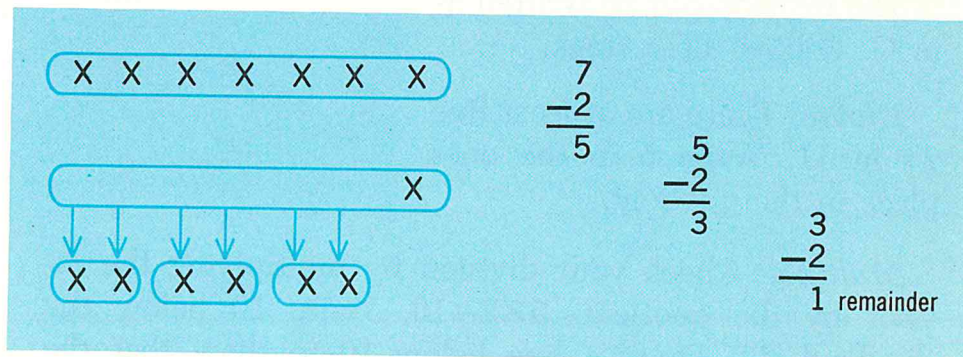
b
 $72 - 45 = \square$ 27

$39 + \square = 100$ 61

Division with a Remainder Other Than Zero

Janet has 7 socks to fold in pairs. How many pairs will she have and how many will be left?

You are to separate a set into groups of equal size, so you are to divide 7 by 2. Try using repeated subtraction.



How many repeated subtractions are shown? Can you make a fourth subtraction of 2? Why not? The amount left after the final subtraction is done is called the remainder.

Do you see that $7 \div 2 = 3$, remainder 1? Janet will have 3 pairs of socks with 1 sock remaining.

Oral How many repeated subtractions of 2 can you make from 3? From 5? From 9? What remains?

1; 2; 4; remainder 1

Written Copy. Complete each statement below.

a

1. $3 \div 2 = \underline{1}$, remainder 1

2. $9 \div 2 = \underline{4}$, remainder 1

3. $13 \div 2 = \underline{6}$, remainder 1

b

$5 \div 2 = \underline{2}$, remainder 1

$11 \div 2 = \underline{5}$, remainder 1

$15 \div 2 = \underline{7}$, remainder 1

Dividing by 2 with a Remainder of 1

Look at A and B at the right. Do you see that 11 can be divided into 5 groups of 2 with a remainder of 1?

The division can be written as in C. Follow these steps:

Divide: There are at least five 2's in 11. Write 5 in the ones place in the quotient.

Multiply: Check your division by multiplying the divisor by the quotient. $5 \times 2 = 10$. Write 10 below the dividend, 11. Draw a line below 10 to show that the division is finished.

Subtract: Compare the product with the dividend. $11 - 10 = 1$. You can see that 2 is contained in 11 five times with a remainder of 1.

Oral Tell the steps used in each division below.

See paragraphs above.

$$\begin{array}{r} a \\ 2 \overline{)3} \end{array}$$

$$\begin{array}{r} b \\ 2 \overline{)5} \end{array}$$

$$\begin{array}{r} c \\ 2 \overline{)7} \end{array}$$

$$\begin{array}{r} d \\ 2 \overline{)9} \end{array}$$

Written Copy, using the sign $\overline{)}$. Find each quotient and remainder.

$$1. \quad \begin{array}{c} a \\ 12 \div 2 = \square \end{array}$$

$$\begin{array}{c} b \\ 13 \div 2 = \square \end{array}$$

$$\begin{array}{c} c \\ 14 \div 2 = \square \end{array}$$

$$\begin{array}{c} d \\ 15 \div 2 = \square \end{array}$$

$$2. \quad \begin{array}{c} 16 \div 2 = \square \end{array}$$

$$\begin{array}{c} 17 \div 2 = \square \end{array}$$

$$\begin{array}{c} 18 \div 2 = \square \end{array}$$

$$\begin{array}{c} 19 \div 2 = \square \end{array}$$

Dividing by 3 with a Remainder of 1 or 2

Which of the above numbers do you say when you skip-count by 3? Such numbers are **multiples** of 3. What are some other multiples of 3?

Suppose you wish to divide 11 by 3. See how knowing the multiples of 3 helps you. *Think:* 11 is not a multiple of 3. Which multiple of 3 is closest to but less than 11? It is 9. $9 \div 3 = 3$.

$$\begin{array}{r} 3 \text{ r}2 \\ 3 \overline{) 11} \\ \underline{-9} \\ 2 \end{array}$$

Divide: There are at least three 3's in 11. Write 3 in the ones place in the quotient.

Multiply: $3 \times 3 = 9$. Write 9 below 11. Why is a line drawn underneath the 9?

Subtract: $11 - 9 = 2$. Write 2 below the line. 2 is the remainder. Write r2 after the quotient, 3.

Oral Tell the steps to use in each division. See paragraphs above.

- | | | |
|--------------------------------|--------------------------------|--------------------------------|
| a
1. $6 \div 3 = \square$ | b
2. $7 \div 3 = \square$ | c
3. $8 \div 3 = \square$ |
| 2 | $2 \text{ r}1$ | $2 \text{ r}2$ |
| 3 | $3 \text{ r}1$ | $3 \text{ r}2$ |
| 4. $9 \div 3 = \square$ | 5. $10 \div 3 = \square$ | 6. $11 \div 3 = \square$ |
| 4 | $4 \text{ r}1$ | $4 \text{ r}2$ |
| 7. $12 \div 3 = \square$ | 8. $13 \div 3 = \square$ | 9. $14 \div 3 = \square$ |

Written Copy. Write each quotient and remainder.

- | a | b | c | d | e | f |
|------------------------|---------------------|---------------------|---------------------|---------------------|---------------------|
| 1. $3 \overline{) 23}$ | $3 \overline{) 16}$ | $3 \overline{) 25}$ | $3 \overline{) 22}$ | $3 \overline{) 26}$ | $3 \overline{) 17}$ |
| $7 \text{ r}2$ | $5 \text{ r}1$ | $8 \text{ r}1$ | $7 \text{ r}1$ | $8 \text{ r}2$ | $5 \text{ r}2$ |
| $1 \text{ r}1$ | $6 \text{ r}1$ | $9 \text{ r}2$ | $9 \text{ r}1$ | $1 \text{ r}2$ | $6 \text{ r}2$ |
| 2. $3 \overline{) 4}$ | $3 \overline{) 19}$ | $3 \overline{) 29}$ | $3 \overline{) 28}$ | $3 \overline{) 5}$ | $3 \overline{) 20}$ |

Because the procedure in using this page parallels that used on page T268, no page T272 is included.

Solving Problems

Read each story problem. Pay special attention to the question. If sets are to be thought of as being put together, you are to add the numbers of the sets. If sets are to be taken apart, or if you are to find out by how many the number of one set differs from that of another, subtract the numbers of the sets. If you are to find how many in all in a number of sets of equal size, multiply. If you are to find how many in each group, or how many groups of equal size, you are to divide.

Oral Tell how to solve each problem.

1. A milkman sold 2342 bottles of milk on Monday, 325 bottles on Tuesday, and 1379 on Wednesday. How many bottles of milk did he sell in the three days?
Add; $2342+325+1379=\square$ 4046 bottles
2. The milkman delivered 3 quarts of milk to Mrs. Smith every day for 8 days. How many quarts of milk did he deliver in the 8 days?
Multiply; $8 \times 3 = \square$ 24 qts.
3. Mary has 12 roses. If she puts 4 roses in each bowl, how many bowls will she need to hold all of the roses?
Divide; $12 \div 4 = \square$ 3 bowls
4. Ann's uncle gave her \$5.00 to spend for her birthday. She has spent \$4.26. How much has she left?
Subtract; $5.00 - 4.26 = \square$ \$.74
5. Peter had 6 candy bars. He gave $\frac{1}{3}$ of them to Marvin. How many candy bars did he give Marvin?
Divide; $6 \div 3 = \square$ 2 candy bars
6. Peter spent \$3.89 for meat and \$5.72 for groceries. How much did he spend in all?
Add; $3.89 + 5.72 = \square$ \$9.61

Written Solve problems 1 through 6 above. *See above.*

Because the procedure in using this page parallels that of previous pages of *Checkup Time* (see T181 or T161), no page T273 is included.

Checkup Time

The numerals in () tell the pages where you can turn for help if you need it.

Important Ideas

1. Each shape has a name, such as *square*, *circle*, *rectangle*, or *triangle*. (255, 256, 257)

2. When any object is cut into parts of equal size, each part is called a *fractional part* of the whole object. (258)

3. $\frac{1}{2}$ of an object means 1 of 2 equal parts of it. (258)

4. $\frac{1}{8}$ of anything is larger than $\frac{1}{8}$ of it. (261)

5. You can find the fractional part of a number by dividing. (262, 263)

6. You may have a remainder of 1 when you divide a number by 2, and a remainder of 1 or 2 when you divide a number by 3. (270, 271)

Questions to Discuss

See below.

1. What things have the shape of a square? A circle? A rectangle? A triangle? (255, 256, 257)

1. Answers will vary. 1

2. A pie divided into 4's has fewer pieces

3. Divide the number by the lower part of the fraction; because we want to know how many times the fractional part is contained in the original number

4. Use repeated subtraction; or divide, multiply, subtract

2. Why is $\frac{1}{4}$ of a pie larger than $\frac{1}{8}$ of a pie? (261)

3. How can you find the fractional part of a number? Why do you divide? (262)

4. What steps would you take to do the division at the right? (269, 270)

$$\begin{array}{r} 7 \text{ r} 1 \\ 2 \overline{)15} \end{array}$$

Written Practice

Solve each of these problems. (268, 272)

1. Mary had 17 flowers. She put 5 in each flower bowl. How many bowls did she use? How many flowers were left? $17 \div 5 = \square$
3 bowls; 2 flowers left over

2. On the playground, 19 boys formed 2 equal groups for a game. How many boys were there in each group and how many boys were left? $19 \div 2 = \square$
9 boys in each group, 1 left over

3. Paul has 29 plants to set out in 3 equal rows. How many should be put in each row? How many plants will be left? $29 \div 3 = \square$
9 in each row; 2 left

Self-Evaluation

Part 1 Copy. Write each sum or difference.

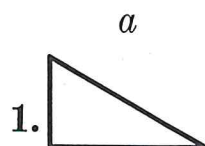
	<i>a</i>	<i>b</i>	<i>c</i>
1.	$\begin{array}{r} 2134 \\ 862 \\ +1426 \\ \hline 4422 \end{array}$	$\begin{array}{r} 3792 \\ 1584 \\ +3361 \\ \hline 8737 \end{array}$	$\begin{array}{r} 2445 \\ 1059 \\ +5004 \\ \hline 8508 \end{array}$
2.	$\begin{array}{r} 9643 \\ -4280 \\ \hline 5363 \end{array}$	$\begin{array}{r} 5218 \\ -2579 \\ \hline 2639 \end{array}$	$\begin{array}{r} 6354 \\ -1897 \\ \hline 4457 \end{array}$

Copy. Write each product or quotient.

	<i>a</i>	<i>b</i>	<i>c</i>	<i>d</i>
3.	$\begin{array}{r} 7 \\ \times 3 \\ \hline 21 \end{array}$	$\begin{array}{r} 9 \\ \times 4 \\ \hline 36 \end{array}$	$\begin{array}{r} 4 \\ \times 5 \\ \hline 20 \end{array}$	$\begin{array}{r} 8 \\ \times 7 \\ \hline 56 \end{array}$

4. $2 \overline{)147}$ $2 \overline{)178}$ $3 \overline{)113}$ $23 \overline{)268}$ $2 \overline{)147}$ $2 \overline{)178}$ $3 \overline{)113}$ $23 \overline{)268}$

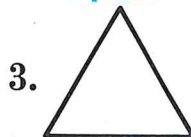
Part 2 Write the name of each of the following shapes.



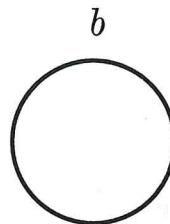
triangle



square



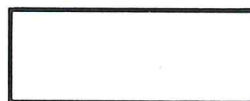
triangle



circle



circle



rectangle

Part 3 Solve each problem.

1. A quart of ice cream costs 78¢. How much will 2 quarts cost? $78 \times 2 = \square$ \$1.56

2. When peaches sell at 3 lb. for 27¢, what is the cost of each pound of peaches? $27 \div 3 = \square$ 9¢

3. Paul weighs 56 lb. Mark weighs 48 lb. How much more does Paul weigh than Mark? $56 - 48 = \square$ 8 lb.

4. Ann is reading a book with 192 pages. She has read 78 pages. How many more pages has she to read? $192 - 78 = \square$ 114 pages

5. Joe and his father bought a shirt for \$2.75, a hat for \$1.79, and a tie for \$1.25. How much did they spend? $275 + 179 + 125 = \square$ \$5.79

6. Carl gave $\frac{1}{3}$ of his 24 marbles to his brother. How many marbles did he give his brother? $24 \div 3 = \square$ 8 marbles

7. How many pieces of ribbon 1 yard long could be cut from a piece of ribbon 20 feet long? How many feet of ribbon would be left? (3 ft. = 1 yd.) $20 \div 3 = \square$ 6 pieces; 2 feet left over

$\times \div$	1	2	3	4	5	6	7	8	9
1	1	2	3	4	5	6	7	8	9
2	2	4	6	8	10	12	14	16	18
3	3	6	9	12	15	18	21	24	27
4	4	8	12	16	20	24	28	32	36
5	5	10	15	20	25	30	35	40	45
6	6	12	18	24	30	36	42	48	54
7	7	14	21	28	35	42	49	56	63
8	8	16	24	32	40	48	56	64	72
9	9	18	27	36	45	54	63	72	81



Using a Multiplication and Division Table

Suppose you want to know how many 8's are contained in 48. Begin by finding 8 in the top row of the table above. Follow column 8 down to 48. What numeral is in the front column across from 48? Does $8 \times 6 = 48$? Then $48 \div 8 = 6$ because multiplication and division are inverse operations.

Using the table does $7 \times 7 = 49$? Then $49 \div 7 = 7$. Why?

Oral Read. Replace each \square with a number word. Use the table if you need help. **Numerals only are given.**

- | | | | |
|---|---|--|---|
| <p>a 48</p> <p>1. $6 \times 8 = \square$</p> <p>2. $8 \times \square = 56$</p> <p>3. $6 \times \square = 54$</p> <p>4. $8 \times \square = 48$</p> | <p>b 56</p> <p>$8 \times 7 = \square$</p> <p>$\square \times 9 = 54$</p> <p>$\square \times 6 = 48$</p> <p>$\square \times 6 = 54$</p> | <p>c 48</p> <p>$8 \times 6 = \square$</p> <p>$7 \times 7 = \square$</p> <p>$6 \times \square = 48$</p> <p>$7 \times \square = 56$</p> | <p>d</p> <p>$\square \times 6 = 54$</p> <p>$7 \times 8 = \square$</p> <p>$\square \times 7 = 49$</p> <p>$9 \times 6 = \square$</p> |
|---|---|--|---|

Multiplying and Dividing by 7, 8, and 9

Try skip counting by 8 through 64. You will find that the sum of eight 8's equals 64. Now skip count by 8 to 72. Did you find that the sum of nine 8's equals 72? Now skip count by 9 to 63, to 72, and to 81. By skip counting, you found the products for multiplications you have not studied before. The multiplications are shown at the right. Use these multiplication statements and the fact that multiplication and division are inverse operations to check each of these division statements: $64 \div 8 = 8$, $63 \div 7 = 9$, $72 \div 9 = 8$, $72 \div 8 = 9$, $81 \div 9 = 9$.

$8 \times 8 = 64$

$8 \times 9 = 72$

$9 \times 7 = 63$

$9 \times 8 = 72$

$9 \times 9 = 81$

Oral Read. Replace each \square with a number word.

Numerals only are given.

a 9	b 9	c 8	d 7
$72 \div 8 = \square$	$81 \div 9 = \square$	$64 \div 8 = \square$	$63 \div 9 = \square$

Written Copy rows 1 through 7. Replace each \square with a numeral.

a 64	b 81	c 9	d 9
1. $8 \times 8 = \square$	$9 \times 9 = \square$	$63 \div 7 = \square$	$\square \times 8 = 72$
8	72	63	8
2. $9 \times \square = 72$	$9 \times 8 = \square$	$7 \times 9 = \square$	$\square \times 9 = 72$
9	9	7	8
3. $8 \times \square = 72$	$7 \times \square = 63$	$9 \times \square = 63$	$64 \div 8 = \square$
9	7	8	63
4. $\square \times 7 = 63$	$\square \times 9 = 63$	$8 \times \square = 64$	$9 \times 7 = \square$
8	9	9	9
5. $\square \times 8 = 64$	$\square \times 9 = 81$	$72 \div 8 = \square$	$9 \times \square = 81$
9	72	9	7
6. $81 \div 9 = \square$	$8 \times 9 = \square$	$63 \div \square = 7$	$63 \div 9 = \square$
7	9	8	49
7. $\square \times 7 = 49$	$72 \div \square = 8$	$64 \div \square = 8$	$\square \div 7 = 7$

Multiplying Ten by Ones

Bob has 3 groups, or sets, of 10 tickets each. How many tickets does he have?

To solve the problem, think of the 3 sets of tickets as being joined, or put together. Each set has the same number, 10, and you have 3 such sets; so you multiply 10 by 3. The arithmetic statement is $3 \times 10 = \square$.

Can you multiply 1 one by 3? Then you can multiply 1 ten by 3. The product is 3 tens, or 30.

Study each statement at the right. You multiply tens as you multiply ones. What is the product when you multiply 1 by a number? When you multiply 10 by a number?

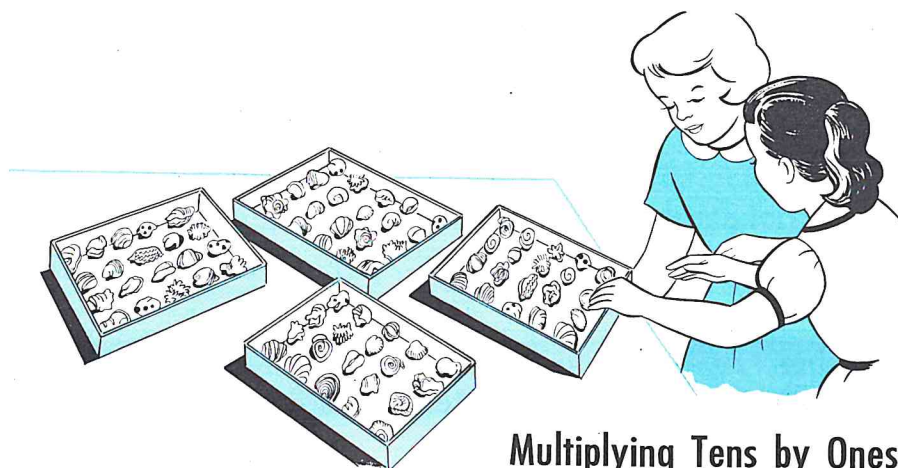
A	B
$1 \times 1 = 1$	$1 \times 10 = 10$
$2 \times 1 = 2$	$2 \times 10 = 20$
$3 \times 1 = 3$	$3 \times 10 = 30$

A shortcut for multiplying 1 by a number, is to simply name the number. To multiply 10 by a number, write the name of the number and place a zero after it.

Oral Read. Replace each \square with a number word.
Numerals only are given.

<i>a</i>	<i>b</i>	<i>c</i>	<i>d</i>
4	40	5	50
1. $4 \times 1 = \square$	$4 \times 10 = \square$	$5 \times 1 = \square$	$5 \times 10 = \square$
6	60	7	70
2. $6 \times 1 = \square$	$6 \times 10 = \square$	$7 \times 1 = \square$	$7 \times 10 = \square$
8	80	9	90
3. $8 \times 1 = \square$	$8 \times 10 = \square$	$9 \times 1 = \square$	$9 \times 10 = \square$
3	20	2	10
4. $3 \times 1 = \square$	$2 \times 10 = \square$	$2 \times 1 = \square$	$1 \times 10 = \square$
1	30	10	60
5. $1 \times 1 = \square$	$3 \times 10 = \square$	$10 \times 1 = \square$	$6 \times 10 = \square$

Written Copy rows 1 through 3. Replace each \square with the correct numeral. *See above.*



Multiplying Tens by Ones

Mary has 4 boxes of shells in a collection. She has 20 shells in each box. How many shells does she have in her collection?

You are to think of 4 sets of equal size as being put together; so you multiply. The arithmetic statement is $4 \times 20 = \square$. The problem can be solved by using repeated addition or by multiplying as shown.

20	
20	
20	20
+20	$\times 4$
<hr/> 80	<hr/> 80

You can see that 4 sets of 20 (added) equal 80. Mary has 80 shells. You may remember that you add tens as you add ones. You also multiply tens as you multiply ones.

Oral Read. Replace each \square with a number word.
Numerals only are given.

- | | <i>a</i> | <i>b</i> | <i>c</i> | <i>d</i> |
|----|------------------------|-------------------------|------------------------|-------------------------|
| 1. | $2 \times 2 = \square$ | $2 \times 20 = \square$ | $2 \times 3 = \square$ | $2 \times 30 = \square$ |
| 2. | $2 \times 4 = \square$ | $2 \times 40 = \square$ | $3 \times 2 = \square$ | $3 \times 20 = \square$ |
| 3. | $3 \times 3 = \square$ | $3 \times 30 = \square$ | $4 \times 2 = \square$ | $4 \times 20 = \square$ |

Written Copy rows 1 through 3. Replace each \square with the correct numeral. **See above.**

B		1 2	means 10 + 2
		<u>X 4</u>	means 4 of each
4 X 2 =		8	1st partial product
4 X 10 =		<u>40</u>	2nd partial product
Add: 8 + 40 =		<u>48</u>	product

Multiplying Tens and Ones

You should have no difficulty multiplying 12 by 4 if you think of 12 as $10+2$. Find the product as shown in A above. Then write as in B by following these steps:

Multiply 2 by 4: $4 \times 2 = 8$. 8 is a partial product.

Multiply 10 by 4: $4 \times 10 = 40$. 40 is a partial product.

Add the partial products: $8 + 40 = 48$. Thus, $4 \times 12 = 48$.

We have just used the *distributive property of multiplication over addition*: The sum of two numbers may be multiplied by a third number by multiplying each addend of the sum by the third number and adding the two partial products. For example, see A above.

Oral Tell the steps used in each multiplication. See example above.

$2 \times 12 = \square$
 $2 \times (10 + 2) = \square$
 $(2 \times 10) + (2 \times 2) = \square$
 $20 + 4 = 24$

b

$$\begin{array}{r} 12 \\ \times 2 \\ \hline 2 \times 2 = 4 \\ 2 \times 10 = 20 \\ \hline \text{Add: } 4 + 20 = 24 \end{array}$$

Written Copy. Write each partial product and each product. **Products only.**

	<i>a</i>	<i>b</i>	<i>c</i>	<i>d</i>	<i>e</i>	<i>f</i>	<i>g</i>
1.	21 <u>×3</u> 63	22 <u>×2</u> 44	21 <u>×4</u> 84	11 <u>×5</u> 55	13 <u>×3</u> 39	33 <u>×3</u> 99	11 <u>×3</u> 33
2.	23 <u>×2</u> 46	43 <u>×2</u> 86	22 <u>×3</u> 66	42 <u>×2</u> 84	12 <u>×3</u> 36	22 <u>×4</u> 88	31 <u>×3</u> 93
							279

Using a Grid in Multiplying Two-Digit Numbers

Suppose you are to multiply 32 by 3. First think of 32 as 3 tens and 2 ones. Then you can use the distributive property of multiplication over addition to multiply as shown.

Ones: 3 ones \times 2 ones
= 6 ones. Write 6 in the ones place as the first partial product.

Tens: 3 ones \times 3 tens
= 9 tens. Write 9 tens and 0 ones, or 90 as the second partial product.

		T 0
		32
		$\times 3$
3 ones \times 2 ones = 6 ones =		6
3 ones \times 3 tens = 9 tens =		90
Add: 6 + 90 =		96

Add: $6 + 90 = 96$. The product is 96.

Oral Tell how you would use the grid in doing each of the multiplications in rows 1 and 2. See example above.

	<i>a</i>	<i>b</i>	<i>c</i>	<i>d</i>	<i>e</i>	<i>f</i>	<i>g</i>
1.	$\begin{array}{r} 21 \\ \times 3 \\ \hline 63 \end{array}$	$\begin{array}{r} 34 \\ \times 2 \\ \hline 68 \end{array}$	$\begin{array}{r} 24 \\ \times 2 \\ \hline 48 \end{array}$	$\begin{array}{r} 32 \\ \times 3 \\ \hline 96 \end{array}$	$\begin{array}{r} 11 \\ \times 4 \\ \hline 44 \end{array}$	$\begin{array}{r} 22 \\ \times 3 \\ \hline 66 \end{array}$	$\begin{array}{r} 11 \\ \times 5 \\ \hline 55 \end{array}$
2.	$\begin{array}{r} 30 \\ \times 2 \\ \hline 60 \end{array}$	$\begin{array}{r} 20 \\ \times 4 \\ \hline 80 \end{array}$	$\begin{array}{r} 10 \\ \times 3 \\ \hline 30 \end{array}$	$\begin{array}{r} 40 \\ \times 2 \\ \hline 80 \end{array}$	$\begin{array}{r} 10 \\ \times 2 \\ \hline 20 \end{array}$	$\begin{array}{r} 20 \\ \times 2 \\ \hline 40 \end{array}$	$\begin{array}{r} 22 \\ \times 2 \\ \hline 44 \end{array}$
3.	$\begin{array}{r} 30 \\ \times 3 \\ \hline 90 \end{array}$	$\begin{array}{r} 11 \\ \times 2 \\ \hline 22 \end{array}$	$\begin{array}{r} 10 \\ \times 5 \\ \hline 50 \end{array}$	$\begin{array}{r} 12 \\ \times 3 \\ \hline 36 \end{array}$	$\begin{array}{r} 42 \\ \times 2 \\ \hline 84 \end{array}$	$\begin{array}{r} 12 \\ \times 4 \\ \hline 48 \end{array}$	$\begin{array}{r} 21 \\ \times 2 \\ \hline 42 \end{array}$
4.	$\begin{array}{r} 23 \\ \times 3 \\ \hline 69 \end{array}$	$\begin{array}{r} 31 \\ \times 2 \\ \hline 62 \end{array}$	$\begin{array}{r} 13 \\ \times 3 \\ \hline 39 \end{array}$	$\begin{array}{r} 14 \\ \times 2 \\ \hline 28 \end{array}$	$\begin{array}{r} 33 \\ \times 3 \\ \hline 99 \end{array}$	$\begin{array}{r} 31 \\ \times 3 \\ \hline 93 \end{array}$	$\begin{array}{r} 13 \\ \times 2 \\ \hline 26 \end{array}$

Written Copy rows 1 through 4. Write each partial product and each product. Products only.

T	O
2	6
2	6
+	2
7	8

$$\begin{array}{l}
 3 \text{ ones} \times 6 \text{ ones} = 18 \text{ ones} = \\
 3 \text{ ones} \times 2 \text{ tens} = 6 \text{ tens} = \\
 \text{Add: } 18 + 60 =
 \end{array}$$

T	O
2	6
X	3
1	8
6	0
7	8

Changing the Form of Ones to Tens

The picture above shows two ways to find the sum of three 26's. Study the addition. First the ones were added. What change in form was made in the 18 ones? Then the tens were added.

Now study the multiplication. First the ones were multiplied. How were the 18 ones written? Then the tens were multiplied. How were the 6 tens written?

In multiplication, the form of ones is changed to tens and ones whenever the partial product in the ones place is a number greater than 9.

Oral Read. Tell what steps were taken in each multiplication below. *See example above.*

$$\begin{array}{r}
 a \\
 26 \\
 \times 3 \\
 \hline
 18 \\
 60 \\
 \hline
 78
 \end{array}$$

$$\begin{array}{r}
 b \\
 18 \\
 \times 3 \\
 \hline
 24 \\
 30 \\
 \hline
 54
 \end{array}$$

$$\begin{array}{r}
 c \\
 24 \\
 \times 4 \\
 \hline
 16 \\
 80 \\
 \hline
 96
 \end{array}$$

$$\begin{array}{r}
 d \\
 16 \\
 \times 4 \\
 \hline
 24 \\
 40 \\
 \hline
 64
 \end{array}$$

Written Copy. Write each product.

$$\begin{array}{r}
 1. \quad a \\
 37 \\
 \times 2 \\
 \hline
 74 \\
 2. \quad 28 \\
 \times 3 \\
 \hline
 84
 \end{array}$$

$$\begin{array}{r}
 b \\
 19 \\
 \times 3 \\
 \hline
 57 \\
 16 \\
 \times 4 \\
 \hline
 64
 \end{array}$$

$$\begin{array}{r}
 c \\
 23 \\
 \times 4 \\
 \hline
 92 \\
 13 \\
 \times 5 \\
 \hline
 65
 \end{array}$$

$$\begin{array}{r}
 d \\
 15 \\
 \times 5 \\
 \hline
 75 \\
 26 \\
 \times 2 \\
 \hline
 52
 \end{array}$$

$$\begin{array}{r}
 e \\
 48 \\
 \times 2 \\
 \hline
 96 \\
 27 \\
 \times 3 \\
 \hline
 81 \\
 281
 \end{array}$$

Changing the Form of Tens to Hundreds

H	T	O
	4	2
	4	2
+	4	2
1	2	6

$$3 \text{ ones} \times 2 \text{ ones} = 6 \text{ ones} =$$

$$3 \text{ ones} \times 4 \text{ tens} = 12 \text{ tens} =$$

$$6 + 120 =$$

H	T	O
	4	2
	X	3
		6
1	2	0
1	2	6

Shown above are two ways to find the sum of three 42's. In the addition, the form of 12 tens was changed to 1 hundred and 2 tens. What was done to the form of 12 tens in the multiplication? The form of tens is changed to hundreds and tens whenever the partial product in the tens place is a number greater than 9 tens.

Oral Read. Tell what steps were taken in each multiplication below. See example above.

a

H	T	O
	7	2
	X	4
		8
2	8	0
2	8	8

b

H	T	O
	8	3
	X	3
		9
2	4	0
2	4	9

c

H	T	O
	6	4
	X	2
		8
1	2	0
1	2	8

d

H	T	O
	9	3
	X	3
		9
2	7	0
2	7	9

Written Copy. Write each partial product and product.
Products only.

	<i>a</i>	<i>b</i>	<i>c</i>	<i>d</i>	<i>e</i>	<i>f</i>	<i>g</i>
1.	74 ×2 <u>148</u>	82 ×4 <u>328</u>	50 ×9 <u>450</u>	53 ×3 <u>159</u>	84 ×2 <u>168</u>	93 ×2 <u>186</u>	52 ×3 <u>156</u>
2.	81 ×4 <u>324</u>	62 ×4 <u>248</u>	90 ×3 <u>270</u>	94 ×2 <u>188</u>	73 ×2 <u>146</u>	61 ×5 <u>305</u>	51 ×3 <u>153</u>

Multiplying a Hundred by Ones

Do you know how to multiply 1 one by 3? 1 ten by 3? If so, you should be able to multiply 1 hundred by 3. The product is 3 hundreds, or 300.

Study each statement below. You can see that you multiply hundreds as you multiply tens or ones.

$1 \times 1 = 1$

$2 \times 1 = 2$

$3 \times 1 = 3$

$4 \times 1 = 4$

$1 \times 10 = 10$

$2 \times 10 = 20$

$3 \times 10 = 30$

$4 \times 10 = 40$

$1 \times 100 = 100$

$2 \times 100 = 200$

$3 \times 100 = 300$

$4 \times 100 = 400$

To multiply 1 by a number, simply name the number. What do you do to multiply 10 by a number? How many zeros do you place after the name of a number when you multiply 100 by the number?

Oral Read. Replace each \square with a number word.

Numerals only are given.

a
1. $4 \times 1 = \square$

2. $5 \times 1 = \square$

3. $6 \times 1 = \square$

4. $7 \times 1 = \square$

5. $8 \times 1 = \square$

6. $9 \times 1 = \square$

b
 $4 \times 10 = \square$

$5 \times 10 = \square$

$6 \times 10 = \square$

$7 \times 10 = \square$

$8 \times 10 = \square$

$9 \times 10 = \square$

c
 $4 \times 100 = \square$

$5 \times 100 = \square$

$6 \times 100 = \square$

$7 \times 100 = \square$

$8 \times 100 = \square$

$9 \times 100 = \square$

Written Copy rows 1 through 6 above. Replace each \square with the correct numeral. *See above.*

Multiplying Hundreds by Ones

Nancy had 3 boxes of gummed labels with 200 labels in each box. How many gummed labels did Nancy have?

You are to think of sets that are equal in size as being put together; so you multiply. The arithmetic statement is $3 \times 200 = \square$. The problem can be solved by using repeated addition as in A. You can also use multiplication as in B.

You can see that 3 sets of 200 are equal to one set of 600. Nancy had 600 gummed labels.

A	B
200 200 <u>+200</u> 600	200 <u>$\times 3$</u> 600

Do you remember that you add hundreds in the same way that you add ones? You also multiply hundreds in the same way that you multiply ones.

Oral Read. Replace each \square with a number word.
Numerals only are given.

- | a | b | c |
|---------------------------|-------------------------|--------------------------|
| 1. $2 \times 2 = \square$ | $2 \times 20 = \square$ | $2 \times 200 = \square$ |
| 2. $2 \times 3 = \square$ | $2 \times 30 = \square$ | $2 \times 300 = \square$ |
| 3. $2 \times 4 = \square$ | $2 \times 40 = \square$ | $2 \times 400 = \square$ |
| 4. $3 \times 3 = \square$ | $3 \times 30 = \square$ | $3 \times 300 = \square$ |
| 5. $3 \times 2 = \square$ | $3 \times 20 = \square$ | $3 \times 200 = \square$ |
| 6. $4 \times 2 = \square$ | $4 \times 20 = \square$ | $4 \times 200 = \square$ |

Written Copy rows 1 through 6 above. Replace each \square with the missing numeral. See above.

Multiplying Three-Digit Numbers

Think of 232 as 2 hundreds and 3 tens and 2 ones. Then you can use the distributive property of multiplication over addition to multiply as shown below.

	H	T	O
	2	3	2
		×	3
3 ones × 2 ones = 6 ones =			6
3 ones × 3 tens = 9 tens =			90
3 ones × 2 hundreds = 6 hundreds =	6	0	0
Add: 6 + 90 + 600 =	6	9	6

Which number is the first partial product? The second partial product? The third partial product? The product is 6 hundreds, 9 tens, and 6 ones, or 696.

Oral Tell what steps you would take to complete each multiplication below. See example above.

	<i>a</i>	<i>b</i>	<i>c</i>	<i>d</i>	<i>e</i>	<i>f</i>
1.	423 ×2 <u>846</u>	302 ×3 <u>906</u>	400 ×2 <u>800</u>	304 ×2 <u>608</u>	131 ×3 <u>393</u>	444 ×2 <u>888</u>
2.	201 ×4 <u>804</u>	100 ×5 <u>500</u>	234 ×2 <u>468</u>	333 ×3 <u>999</u>	222 ×2 <u>444</u>	102 ×4 <u>408</u>
3.	320 ×3 <u>960</u>	424 ×1 <u>424</u>	200 ×4 <u>800</u>	420 ×2 <u>840</u>	314 ×2 <u>628</u>	301 ×3 <u>903</u>
4.	111 ×4 <u>444</u>	300 ×3 <u>900</u>	101 ×3 <u>303</u>	120 ×4 <u>480</u>	340 ×2 <u>680</u>	242 ×2 <u>484</u>

Written Copy rows 1 through 4. Write each product.
See above.

Should You Add, Subtract, or Multiply?

Read each story problem. Pay special attention to the question. If sets are to be thought of as being put together, add the numbers of the sets. If sets are to be taken apart, or if you are to find out by how many the number of one set differs from that of another, subtract. If you are to find how many in all the sets of equal size, multiply.

Oral Tell whether you would add, subtract, or multiply to solve each problem. Tell how you decided.

1. Ann is 9 years old. Her sister, Sue, is 15 years old. How much older is Sue than Ann? Subtract; sets are compared $15-9=\square$ 6 years
2. If a small airplane can fly 320 miles in 1 hour, how far can it fly in 3 hours? Multiply; sets of equal size are joined $3\times 320=\square$ 960 miles
3. John caught 7 fish, Tim caught 9, and Al caught 5. How many fish did the three boys catch? Add; sets are joined $7+9+5=\square$ 21 fish
4. Ed's father weighs 172 lb. Ed weighs 59 lb. How much less does Ed weigh than his father? Subtract; sets are compared $172-59=\square$ 113 lb.
5. How many pencils are there in 4 boxes if there are 12 pencils in each box? Multiply; sets of equal size are joined $4\times 12=\square$ 48 pencils
6. Jean paid 7¢ for a ruler and 15¢ for writing paper. How much did she spend for both? Add; sets are joined $7+15=\square$ 22¢
7. On a trip, Paul and his father drove 276 miles the first day, 364 the second, and 179 the third day. How many miles did they drive in three days? Add; sets are joined $276+364+179=\square$ 819 miles

Written Solve problems 1 through 7 above. See above.

$$\begin{array}{r}
 60 \\
 -3 \\
 \hline
 57 \\
 -3 \\
 \hline
 54 \\
 -3 \\
 \hline
 51 \\
 -3 \\
 \hline
 48
 \end{array}$$

— first subtraction
— second subtraction
— third subtraction
— fourth subtraction



Finding the Number of Groups of Equal Size

Betty has run out of space. Perhaps you can finish the work for her. You will be finished when the final remainder is 0. If your work is correct, you will find that twenty 3's are contained in 60.

Oral Tell how many repeated subtractions you would use in answering each question below.

1. How many 2's are contained in 12? **6**
2. How many 2's are contained in 20? **10**
3. How many 3's are contained in 30? **10**

A quick review

- | | <i>a</i> | <i>b</i> | <i>c</i> | <i>d</i> |
|----|--------------------------------------|--------------------------------------|--------------------------------------|--------------------------------------|
| 1. | $\overset{6}{\square} \times 6 = 36$ | $\overset{6}{\square} \times 9 = 54$ | $\overset{8}{\square} \times 6 = 48$ | $\overset{7}{\square} \times 9 = 63$ |
| 2. | $\overset{7}{\square} \times 7 = 49$ | $\overset{8}{\square} \times 8 = 64$ | $\overset{9}{\square} \times 4 = 36$ | $\overset{5}{\square} \times 9 = 45$ |
| 3. | $\overset{6}{\square} \times 7 = 42$ | $\overset{8}{\square} \times 4 = 32$ | $\overset{8}{\square} \times 7 = 56$ | $\overset{4}{\square} \times 9 = 36$ |
| 4. | $\overset{7}{\square} \times 5 = 35$ | $\overset{9}{\square} \times 5 = 45$ | $\overset{7}{\square} \times 6 = 42$ | $\overset{7}{\square} \times 3 = 21$ |
| 5. | $\overset{3}{\square} \times 6 = 18$ | $\overset{6}{\square} \times 8 = 48$ | $\overset{9}{\square} \times 6 = 54$ | $\overset{7}{\square} \times 8 = 56$ |
| 6. | $\overset{9}{\square} \times 8 = 72$ | $\overset{7}{\square} \times 4 = 28$ | $\overset{9}{\square} \times 3 = 27$ | $\overset{9}{\square} \times 7 = 63$ |
| 7. | $\overset{6}{\square} \times 4 = 24$ | $\overset{9}{\square} \times 9 = 81$ | $\overset{8}{\square} \times 3 = 24$ | $\overset{8}{\square} \times 9 = 72$ |

Dividing a Two-Digit Number

How would you use repeated subtraction to find the missing number in $80 \div 2 = \square$? Using division would be faster. You know that $8 \div 2 = 4$. Does $80 \div 2 = 40$?

Read each pair of statements below. How will knowing the first statement in each pair help you know the second statement?

$2 \div 2 = 1$	$20 \div 2 = 10$	$4 \div 2 = 2$	$40 \div 2 = 20$
$6 \div 2 = 3$	$60 \div 2 = 30$	$8 \div 2 = 4$	$80 \div 2 = 40$
$3 \div 3 = 1$	$30 \div 3 = 10$	$6 \div 3 = 2$	$60 \div 3 = 20$

Oral Read. Replace each \square with a number word.

a	b	c	d
1. $9 \div 3 = \square$	$90 \div 3 = \square$	$4 \div 4 = \square$	$40 \div 4 = \square$
2. $8 \div 4 = \square$	$80 \div 4 = \square$	$5 \div 5 = \square$	$50 \div 5 = \square$

Written Use what you have learned about division to solve each of these problems.

- John paid 30¢ for 3 candy bars that were all the same price. How much did each candy bar cost? $30 \div 3 = \square$
10¢
- The teacher had a box of 90 pencils. If she gave 3 pencils to each child, how many children would receive pencils? $90 \div 3 = \square$ 30 children
- 60 children went to the school picnic in 2 buses. If the same number of children rode on each bus, how many children were on each bus? $60 \div 2 = \square$ 30 children

Dividing Tens in a Two-Digit Number

Suppose you are to show all of the steps used in dividing 80 by 2. Then you will do the division using the sign $\overline{)}$. The steps are given below.

Step 1: Think of 80 as 8 tens. Decide how many 2's are contained in 8 tens, or 80. There are 40. Write 40 above 80.

Step 2: Multiply 2 by 40. Write 80 underneath 80. Draw a line to show that this part of the division is complete.

Step 3: Subtract 80 from 80. There is a 0 remainder. The division is complete.

$$\begin{array}{r} 40 \\ 2 \overline{)80} \\ \underline{-80} \\ 0 \end{array}$$

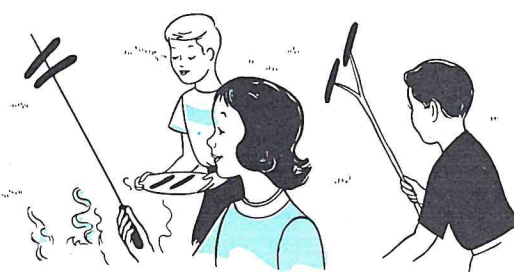
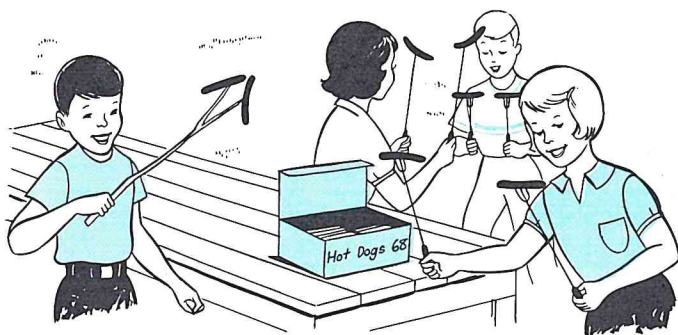
Oral Tell what steps you would take in dividing 20 by 2. In dividing 40 by 2. See paragraph above.

Written Copy. Write each quotient.

$\begin{array}{r} a \\ 20 \\ 4 \overline{)80} \end{array}$	$\begin{array}{r} b \\ 30 \\ 3 \overline{)90} \end{array}$	$\begin{array}{r} c \\ 20 \\ 3 \overline{)60} \end{array}$	$\begin{array}{r} d \\ 10 \\ 3 \overline{)30} \end{array}$	$\begin{array}{r} e \\ 30 \\ 2 \overline{)60} \end{array}$
$\begin{array}{r} 40 \\ 2 \overline{)80} \end{array}$	$\begin{array}{r} 20 \\ 2 \overline{)40} \end{array}$	$\begin{array}{r} 10 \\ 5 \overline{)50} \end{array}$	$\begin{array}{r} 10 \\ 4 \overline{)40} \end{array}$	$\begin{array}{r} 10 \\ 2 \overline{)20} \end{array}$

Can you do this? Each \blacksquare stands for a numeral in the completed multiplication. Replace each \blacksquare with the correct numeral.

$\begin{array}{r} a \\ \blacksquare \blacksquare \\ \times 4 \\ \hline 1 \blacksquare \\ 8 \blacksquare \\ \hline \blacksquare \blacksquare \end{array}$	$\begin{array}{r} b \\ \blacksquare \blacksquare \\ \times \blacksquare \\ \hline 1 \blacksquare \\ 5 \blacksquare \\ \hline \blacksquare \blacksquare \end{array}$	$\begin{array}{r} c \\ \blacksquare \blacksquare \\ \times 2 \\ \hline 1 \blacksquare \\ \blacksquare \blacksquare \\ \hline \blacksquare \blacksquare \end{array}$	$\begin{array}{r} d \\ \blacksquare \blacksquare \\ \times 3 \\ \hline 2 \blacksquare \\ \blacksquare \blacksquare \\ \hline \blacksquare \blacksquare \end{array}$
--	---	---	---



Dividing Tens and Ones

To find the quotient in $68 \div 2 = \square$, think of 68 as $60 + 8$. Since, as shown in A and B, $60 \div 2 = 30$ and $8 \div 2 = 4$, we add the two partial quotients as in C. Thus, $68 \div 2 = 30 + 4$ or 34.

We have just used the *distributive property of division over addition*. This property may be described as follows: The sum of two numbers may be divided by a third number by dividing each addend of the sum by the third number and adding the two partial quotients.

A $60 \div 2 = 30$
 B $8 \div 2 = 4$
 C $30 + 4 = 34$

Two other divisions are shown below. Explain each.

Statement	Think		Write
$69 \div 3 = \square$	$60 \div 3 = 20$	$9 \div 3 = 3$	$69 \div 3 = 23$
$84 \div 4 = \square$	$80 \div 4 = 20$	$4 \div 4 = 1$	$84 \div 4 = 21$

Oral Read. Tell what steps you would take to find each quotient, using the plan suggested above.

1. $\overset{a}{2}\overline{)44}$	$\overset{b}{3}\overline{)93}$	$\overset{c}{4}\overline{)88}$	$\overset{d}{2}\overline{)42}$	$\overset{e}{4}\overline{)48}$
2. $\overset{32}{2}\overline{)64}$	$\overset{32}{3}\overline{)96}$	$\overset{21}{4}\overline{)84}$	$\overset{33}{2}\overline{)66}$	$\overset{24}{2}\overline{)48}$

Written Copy rows 1 and 2. Write each quotient.

See above.

Using a Faster Way to Divide

The division shown at the right is a fast way to divide 86 by 2. Think of 86 as $80+6$. You divide 80 and then you divide 6.

$$\begin{array}{r} 3 \\ 40 \} = 40 + 3 = 43 \\ 2 \overline{)86} \\ \underline{-80} \\ 6 \\ \underline{-6} \\ 0 \end{array}$$

Divide: Decide how many 2's are contained in 8 tens, or 80. There are 40. Write 40 above 86.

Multiply: $40 \times 2 = 80$. Write 80 underneath 86. Draw a line underneath 80. Why?

Subtract: $86 - 80 = 6$. Write 6 in the ones place under the line.

Divide: Decide how many 2's are contained in 6. There are 3. Write 3 in the ones place above 40.

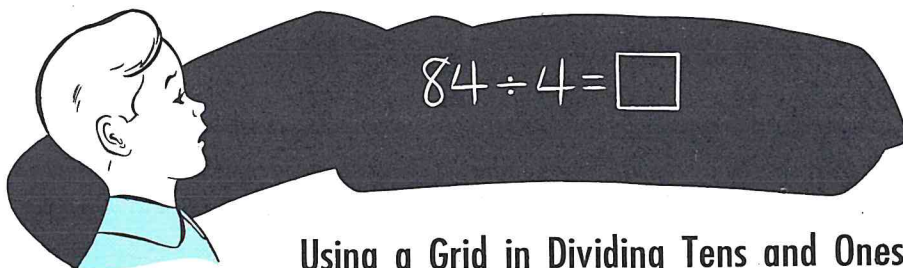
Multiply: $3 \times 2 = 6$. Write 6 underneath 6.

Subtract: $6 - 6 = 0$. There is a 0 remainder. Add 40 and 3 to find the quotient. Does $40 + 3 = 43$? Does $86 \div 2 = 43$?

Oral Tell the steps you would use in completing each division below. See paragraphs above.

a	b	c	d	e
1. $\begin{array}{r} 11 \\ 4 \overline{)44} \end{array}$	$\begin{array}{r} 22 \\ 4 \overline{)88} \end{array}$	$\begin{array}{r} 32 \\ 2 \overline{)64} \end{array}$	$\begin{array}{r} 31 \\ 3 \overline{)93} \end{array}$	$\begin{array}{r} 23 \\ 3 \overline{)69} \end{array}$
2. $\begin{array}{r} 33 \\ 2 \overline{)66} \end{array}$	$\begin{array}{r} 12 \\ 4 \overline{)48} \end{array}$	$\begin{array}{r} 34 \\ 2 \overline{)68} \end{array}$	$\begin{array}{r} 13 \\ 2 \overline{)26} \end{array}$	$\begin{array}{r} 42 \\ 2 \overline{)84} \end{array}$
3. $\begin{array}{r} 13 \\ 3 \overline{)39} \end{array}$	$\begin{array}{r} 43 \\ 2 \overline{)86} \end{array}$	$\begin{array}{r} 12 \\ 3 \overline{)36} \end{array}$	$\begin{array}{r} 14 \\ 2 \overline{)28} \end{array}$	$\begin{array}{r} 21 \\ 4 \overline{)84} \end{array}$

Written Copy rows 1 through 3. Show the steps you would take to complete each division. See example above.



Using a Grid in Dividing Tens and Ones

You have learned how to divide a two-digit number by a one-digit number. As in most arithmetic, once you know how to do a thing, you can begin to use short cuts. The grid at the right will help you learn a division shortcut for dividing 84 by 4. Think of 84 as 8 tens and 4 ones. Then divide the 8 tens and the 4 ones separately as shown on the grid. Begin with the tens.

	T	O
	2	1 or 21
4)	84
	-	8
		04
		-4
		0

Divide: Decide how many 4's are contained in the 8 of the 8 tens. There are 2. Since the 8 stands for 8 tens, write 2 in the tens place of the quotient.

Multiply: 2 tens \times 4 = 8 tens. Write 8 in the tens place underneath 8. Draw a line underneath 8.

Subtract: 8 tens $-$ 8 tens = 0 tens. Write the 0 as the remainder of the tens.

Then consider the ones. First write the 4 ones in the ones place at the right of the remainder of tens.

Divide: Decide how many 4's are contained in 4. There is 1. Write 1 in the ones place of the quotient.

Multiply: 1 one \times 4 = 4 ones. Write 4 in the ones place underneath 4.

Subtract: 4 ones $-$ 4 ones = 0 ones. Write the 0 as the remainder of ones.

Look at the division at the right. It is similar to divisions you have done before. Do you see that there is a remainder of 1 after the last subtraction? Do you see that the remainder is written after the quotient as r1?

$$\begin{array}{r} \text{T} | 0 \\ 3 \overline{) 33} \text{ or } 33 \text{ r } 1 \\ \underline{-6} \\ 07 \\ \underline{-6} \\ 1 \end{array}$$

Oral Read. Tell how to find each quotient and remainder. See example above.

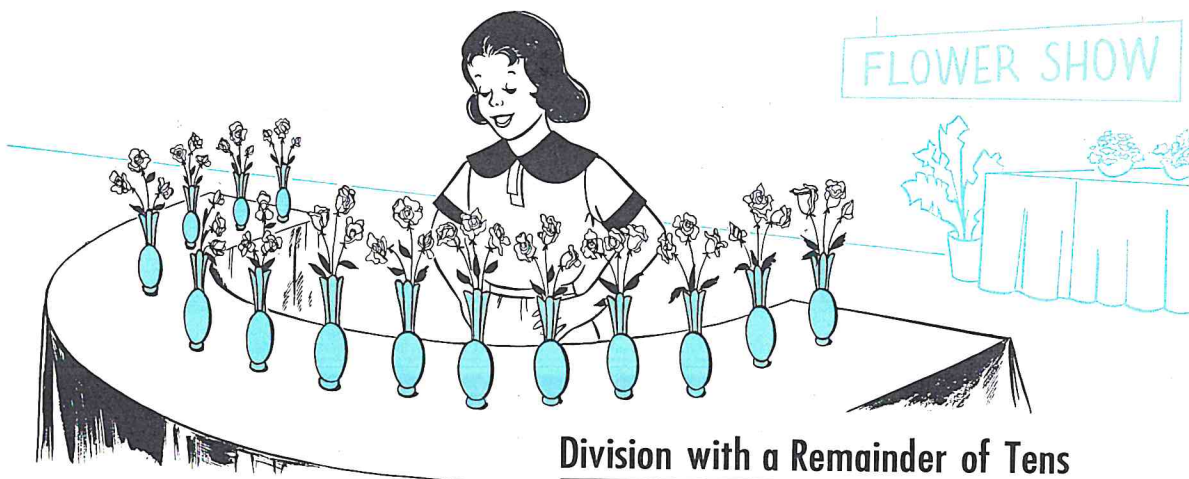
<i>a</i>	<i>b</i>	<i>c</i>	<i>d</i>	<i>e</i>	<i>f</i>
1. $\begin{array}{r} 24 \\ 2 \overline{) 48} \end{array}$	$\begin{array}{r} 31 \\ 3 \overline{) 93} \end{array}$	$\begin{array}{r} 11 \\ 6 \overline{) 66} \end{array}$	$\begin{array}{r} 13 \\ 3 \overline{) 39} \end{array}$	$\begin{array}{r} 34 \\ 2 \overline{) 68} \end{array}$	$\begin{array}{r} 41 \\ 2 \overline{) 82} \end{array}$
2. $\begin{array}{r} 23 \\ 3 \overline{) 69} \end{array}$	$\begin{array}{r} 33 \\ 3 \overline{) 99} \end{array}$	$\begin{array}{r} 35 \\ 2 \overline{) 70} \end{array}$	$\begin{array}{r} 12 \\ 3 \overline{) 36} \end{array}$	$\begin{array}{r} 12 \\ 4 \overline{) 48} \end{array}$	$\begin{array}{r} 11 \\ 5 \overline{) 55} \end{array}$
3. $\begin{array}{r} 41\text{r}1 \\ 2 \overline{) 83} \end{array}$	$\begin{array}{r} 11\text{r}3 \\ 6 \overline{) 69} \end{array}$	$\begin{array}{r} 13\text{r}1 \\ 2 \overline{) 27} \end{array}$	$\begin{array}{r} 11\text{r}1 \\ 7 \overline{) 78} \end{array}$	$\begin{array}{r} 11\text{r}2 \\ 6 \overline{) 68} \end{array}$	$\begin{array}{r} 11\text{r}1 \\ 8 \overline{) 89} \end{array}$
4. $\begin{array}{r} 21\text{r}2 \\ 3 \overline{) 65} \end{array}$	$\begin{array}{r} 12\text{r}1 \\ 4 \overline{) 49} \end{array}$	$\begin{array}{r} 43\text{r}1 \\ 2 \overline{) 87} \end{array}$	$\begin{array}{r} 22\text{r}1 \\ 2 \overline{) 45} \end{array}$	$\begin{array}{r} 21\text{r}1 \\ 4 \overline{) 85} \end{array}$	$\begin{array}{r} 20\text{r}3 \\ 4 \overline{) 83} \end{array}$
5. $\begin{array}{r} 31\text{r}2 \\ 3 \overline{) 95} \end{array}$	$\begin{array}{r} 11\text{r}2 \\ 7 \overline{) 79} \end{array}$	$\begin{array}{r} 34\text{r}1 \\ 2 \overline{) 69} \end{array}$	$\begin{array}{r} 32\text{r}2 \\ 3 \overline{) 98} \end{array}$	$\begin{array}{r} 21\text{r}3 \\ 4 \overline{) 87} \end{array}$	$\begin{array}{r} 31\text{r}1 \\ 3 \overline{) 94} \end{array}$

Written Copy rows 1 through 5 above. Show the steps used in completing each division. Quotients only are given.

A quick review

<i>a</i>	<i>b</i>	<i>c</i>
1. $428 + 346 = \square$	$976 + 484 = \square$	$479 + 846 = \square$
$\begin{array}{r} 774 \\ 6307 \end{array}$	$\begin{array}{r} 1460 \\ 8797 \end{array}$	$\begin{array}{r} 1325 \\ 7105 \end{array}$
2. $2138 + 4169 = \square$	$8412 + 385 = \square$	$2168 + 4937 = \square$
$\begin{array}{r} 8252 \\ 5448 \end{array}$	$\begin{array}{r} 5222 \\ 4898 \end{array}$	$\begin{array}{r} 4409 \\ 1891 \end{array}$
3. $8421 - 169 = \square$	$6543 - 1321 = \square$	$9872 - 5463 = \square$
$\begin{array}{r} 8252 \\ 5448 \end{array}$	$\begin{array}{r} 5222 \\ 4898 \end{array}$	$\begin{array}{r} 4409 \\ 1891 \end{array}$
4. $8347 - 2899 = \square$	$7006 - 2108 = \square$	$3579 - 1688 = \square$
$\begin{array}{r} 5448 \\ 1049 \end{array}$	$\begin{array}{r} 4898 \\ 272 \end{array}$	$\begin{array}{r} 1891 \\ 1009 \end{array}$
5. $2418 - 1369 = \square$	$5149 - 4877 = \square$	$3698 - 2689 = \square$

MORE PRACTICE
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Division with a Remainder of Tens

Suppose you wish to divide 42 by 3. First think of 42 as 4 tens plus 2 ones. Divide the 4 tens by 3 to find a quotient of 1 ten and a remainder of 1 ten. See how this is shown in the grid below. Next use the remainder of 1 ten as follows.

To the remainder of 1 ten, add the 2 ones of the 42. Think of the sum as 12 ones. Using the facts that multiplication and division are inverse operations and that $4 \times 3 = 12$, can you now divide the 12 ones by 3?

T	0
1	4
3	2
-3	
1	2
-1	2
	0

The quotient of $42 \div 3$ is 1 ten and 4 ones, or 14.

Oral Tell what steps you would take in dividing 72 by 3. In dividing 96 by 4. *See paragraphs above.*

Written Copy. Write each quotient.

- | | <i>a</i> | <i>b</i> | <i>c</i> | <i>d</i> | <i>e</i> | <i>f</i> |
|----|--------------------|--------------------|--------------------|--------------------|--------------------|--------------------|
| 1. | $4 \overline{)52}$ | $3 \overline{)75}$ | $4 \overline{)56}$ | $2 \overline{)78}$ | $5 \overline{)85}$ | $6 \overline{)78}$ |
| 2. | $3 \overline{)84}$ | $7 \overline{)84}$ | $2 \overline{)38}$ | $3 \overline{)87}$ | $4 \overline{)92}$ | $5 \overline{)80}$ |

Dividing Hundreds

Study the divisions below.

$$2 \div 2 = 1$$

$$4 \div 2 = 2$$

$$6 \div 2 = 3$$

$$20 \div 2 = 10$$

$$40 \div 2 = 20$$

$$60 \div 2 = 30$$

$$200 \div 2 = 100$$

$$400 \div 2 = 200$$

$$600 \div 2 = 300$$

Do you divide hundreds as you divide tens and ones?

Suppose you wished to divide 864 by 2. You could think of 864 as $800 + 60 + 4$ and divide 800 by 2, 60 by 2, and then 4 by 2. The quotient is $400 + 30 + 2$, or 432.

A fast way to divide 864 by 2 is to write the division on a grid as shown. How many 2's are contained in the 8 of 800? Where is the 4 written? Do you see that you can divide hundreds in the same way you divide tens and ones?

H	T	O
4	3	2
$2 \overline{)864}$		
$\underline{-8}$		
0	6	
$\underline{-6}$		
	0	4
	$\underline{-4}$	
		0

432
$2 \overline{)864}$
$\underline{-8}$
06
$\underline{-6}$
04
$\underline{-4}$
0

Oral Tell the steps you would use in completing each division below.

See paragraphs above.

a

$$1. \quad \begin{array}{r} 200 \\ 3 \overline{)600} \end{array}$$

b

$$2. \quad \begin{array}{r} 300 \\ 2 \overline{)600} \end{array}$$

c

$$3. \quad \begin{array}{r} 200 \\ 4 \overline{)800} \end{array}$$

d

$$4. \quad \begin{array}{r} 212 \\ 4 \overline{)848} \end{array}$$

$$5. \quad \begin{array}{r} 231 \\ 3 \overline{)693} \end{array}$$

$$6. \quad \begin{array}{r} 423 \\ 2 \overline{)846} \end{array}$$

$$7. \quad \begin{array}{r} 324 \\ 2 \overline{)648} \end{array}$$

$$8. \quad \begin{array}{r} 132 \\ 3 \overline{)396} \end{array}$$

$$9. \quad \begin{array}{r} 212r1 \\ 4 \overline{)849} \end{array}$$

$$10. \quad \begin{array}{r} 211r2 \\ 3 \overline{)635} \end{array}$$

$$11. \quad \begin{array}{r} 231r1 \\ 2 \overline{)463} \end{array}$$

$$12. \quad \begin{array}{r} 311r2 \\ 3 \overline{)935} \end{array}$$

Written Copy rows 1 through 3. Show the steps you would use to complete each division. See above.

Because the procedure in using this page parallels that used on page T251, no page T296 is included.

Practicing Division

Written Copy. Write each quotient and remainder.

- | <i>a</i> | <i>b</i> | <i>c</i> | <i>d</i> | <i>e</i> | <i>f</i> |
|------------------------|---------------------|---------------------|---------------------|---------------------|---------------------|
| 1. $3 \overline{)90}$ | $2 \overline{)80}$ | $3 \overline{)60}$ | $2 \overline{)68}$ | $3 \overline{)66}$ | $3 \overline{)93}$ |
| 2. $2 \overline{)46}$ | $4 \overline{)84}$ | $3 \overline{)98}$ | $7 \overline{)71}$ | $3 \overline{)37}$ | $4 \overline{)89}$ |
| 3. $4 \overline{)95}$ | $2 \overline{)57}$ | $5 \overline{)68}$ | $3 \overline{)43}$ | $4 \overline{)66}$ | $2 \overline{)79}$ |
| 4. $5 \overline{)99}$ | $3 \overline{)74}$ | $4 \overline{)58}$ | $5 \overline{)82}$ | $6 \overline{)81}$ | $3 \overline{)59}$ |
| 5. $2 \overline{)684}$ | $3 \overline{)969}$ | $4 \overline{)848}$ | $2 \overline{)865}$ | $4 \overline{)489}$ | $3 \overline{)698}$ |
| 6. $4 \overline{)528}$ | $2 \overline{)581}$ | $4 \overline{)960}$ | $2 \overline{)316}$ | $7 \overline{)850}$ | $6 \overline{)720}$ |
| 7. $6 \overline{)687}$ | $3 \overline{)979}$ | $2 \overline{)853}$ | $4 \overline{)870}$ | $3 \overline{)943}$ | $2 \overline{)475}$ |
| 8. $2 \overline{)637}$ | $5 \overline{)592}$ | $8 \overline{)899}$ | $6 \overline{)695}$ | $7 \overline{)799}$ | $3 \overline{)955}$ |
| 9. $3 \overline{)948}$ | $5 \overline{)586}$ | $7 \overline{)787}$ | $6 \overline{)696}$ | $2 \overline{)653}$ | $4 \overline{)897}$ |

Can you do this? Some of the digits are missing in each of these divisions. Replace each with the correct digit.

<div style="writing-mode: vertical-rl; transform: rotate(180deg);"> MORE PRACTICE PAGE 319 </div>	$ \begin{array}{r} 11 \\ 5 \overline{) 55} \\ \underline{-5} \\ 05 \\ \underline{-5} \\ 0 \end{array} $	$ \begin{array}{r} 24 \\ 3 \overline{) 72} \\ \underline{-6} \\ 12 \\ \underline{-12} \\ 0 \end{array} $	$ \begin{array}{r} 134r1 \\ 4 \overline{) 537} \\ \underline{-4} \\ 13 \\ \underline{-12} \\ 17 \\ \underline{-16} \\ 1 \end{array} $
---	---	--	---

Because the procedure in using this page parallels that used on page T267, no page T297 is included.

Review and Practice

Written Copy. Write each product.

	<i>a</i>	<i>b</i>	<i>c</i>	<i>d</i>	<i>e</i>	<i>f</i>	<i>g</i>
1.	$\begin{array}{r} 7 \\ \times 3 \\ \hline 21 \end{array}$	$\begin{array}{r} 8 \\ \times 2 \\ \hline 16 \end{array}$	$\begin{array}{r} 2 \\ \times 7 \\ \hline 14 \end{array}$	$\begin{array}{r} 4 \\ \times 8 \\ \hline 32 \end{array}$	$\begin{array}{r} 5 \\ \times 7 \\ \hline 35 \end{array}$	$\begin{array}{r} 3 \\ \times 3 \\ \hline 9 \end{array}$	$\begin{array}{r} 8 \\ \times 4 \\ \hline 32 \end{array}$
2.	$\begin{array}{r} 6 \\ \times 2 \\ \hline 12 \end{array}$	$\begin{array}{r} 7 \\ \times 5 \\ \hline 35 \end{array}$	$\begin{array}{r} 5 \\ \times 9 \\ \hline 45 \end{array}$	$\begin{array}{r} 5 \\ \times 6 \\ \hline 30 \end{array}$	$\begin{array}{r} 9 \\ \times 6 \\ \hline 54 \end{array}$	$\begin{array}{r} 4 \\ \times 6 \\ \hline 24 \end{array}$	$\begin{array}{r} 5 \\ \times 5 \\ \hline 25 \end{array}$
3.	$\begin{array}{r} 24 \\ \times 3 \\ \hline 72 \end{array}$	$\begin{array}{r} 17 \\ \times 4 \\ \hline 68 \end{array}$	$\begin{array}{r} 28 \\ \times 6 \\ \hline 168 \end{array}$	$\begin{array}{r} 32 \\ \times 5 \\ \hline 160 \end{array}$	$\begin{array}{r} 32 \\ \times 6 \\ \hline 192 \end{array}$	$\begin{array}{r} 24 \\ \times 5 \\ \hline 120 \end{array}$	$\begin{array}{r} 27 \\ \times 4 \\ \hline 108 \end{array}$
4.	$\begin{array}{r} 304 \\ \times 2 \\ \hline 608 \end{array}$	$\begin{array}{r} 213 \\ \times 4 \\ \hline 852 \end{array}$	$\begin{array}{r} 178 \\ \times 3 \\ \hline 534 \end{array}$	$\begin{array}{r} 365 \\ \times 3 \\ \hline 1095 \end{array}$	$\begin{array}{r} 147 \\ \times 4 \\ \hline 588 \end{array}$	$\begin{array}{r} 159 \\ \times 5 \\ \hline 795 \end{array}$	$\begin{array}{r} 426 \\ \times 4 \\ \hline 1704 \end{array}$

Copy. Write each sum.

	<i>a</i>	<i>b</i>	<i>c</i>	<i>d</i>	<i>e</i>	<i>f</i>	<i>g</i>
1.	$\begin{array}{r} 4 \\ +3 \\ \hline 7 \end{array}$	$\begin{array}{r} 8 \\ +5 \\ \hline 13 \end{array}$	$\begin{array}{r} 35 \\ +3 \\ \hline 38 \end{array}$	$\begin{array}{r} 22 \\ +9 \\ \hline 31 \end{array}$	$\begin{array}{r} 76 \\ +85 \\ \hline 161 \end{array}$	$\begin{array}{r} 132 \\ +25 \\ \hline 157 \end{array}$	$\begin{array}{r} 63 \\ +51 \\ \hline 114 \end{array}$
2.	$\begin{array}{r} 274 \\ +63 \\ \hline 337 \end{array}$	$\begin{array}{r} 467 \\ +85 \\ \hline 552 \end{array}$	$\begin{array}{r} 207 \\ +28 \\ \hline 235 \end{array}$	$\begin{array}{r} 332 \\ +124 \\ \hline 456 \end{array}$	$\begin{array}{r} 278 \\ +345 \\ \hline 623 \end{array}$	$\begin{array}{r} 163 \\ +272 \\ \hline 435 \end{array}$	$\begin{array}{r} 326 \\ +257 \\ \hline 583 \end{array}$
3.	$\begin{array}{r} 4 \\ 8 \\ +31 \\ \hline 43 \end{array}$	$\begin{array}{r} 21 \\ 3 \\ +4 \\ \hline 28 \end{array}$	$\begin{array}{r} 36 \\ 27 \\ +15 \\ \hline 78 \end{array}$	$\begin{array}{r} 49 \\ 76 \\ +30 \\ \hline 155 \end{array}$	$\begin{array}{r} 358 \\ 73 \\ +86 \\ \hline 517 \end{array}$	$\begin{array}{r} 584 \\ 170 \\ +230 \\ \hline 984 \end{array}$	$\begin{array}{r} 2897 \\ 3278 \\ +186 \\ \hline 6361 \end{array}$

Copy. Write each difference.

	<i>a</i>	<i>b</i>	<i>c</i>	<i>d</i>	<i>e</i>	<i>f</i>
1.	$\begin{array}{r} 436 \\ -275 \\ \hline 161 \end{array}$	$\begin{array}{r} 673 \\ -148 \\ \hline 525 \end{array}$	$\begin{array}{r} 364 \\ -287 \\ \hline 77 \end{array}$	$\begin{array}{r} 702 \\ -326 \\ \hline 376 \end{array}$	$\begin{array}{r} 210 \\ -197 \\ \hline 13 \end{array}$	$\begin{array}{r} 800 \\ -539 \\ \hline 261 \end{array}$
2.	$\begin{array}{r} 2653 \\ -895 \\ \hline 1758 \end{array}$	$\begin{array}{r} \$9.42 \\ -5.73 \\ \hline \$3.69 \end{array}$	$\begin{array}{r} 7623 \\ -492 \\ \hline 7131 \end{array}$	$\begin{array}{r} 6000 \\ -4362 \\ \hline 1638 \end{array}$	$\begin{array}{r} 4638 \\ -2846 \\ \hline 1792 \end{array}$	$\begin{array}{r} 9276 \\ -6597 \\ \hline 2679 \\ 297 \end{array}$

Should You Multiply or Divide?

Read each problem carefully. If you are to find how many in all of the equal groups, multiply the numbers. If you are to find how many equal groups, or how many in each equal group, divide the numbers.

Oral Tell what arithmetic statement you would use to solve each problem. Tell how you decided.

1. Janet has a roll of crepe paper with 68 feet of paper in the roll. How many pieces of crepe paper 6 feet long can she cut from the roll, and how many feet will be left? $68 \div 6 = \square$ 11 pieces and 2 feet left over
Divide; find how many equal groups
2. The milkman delivered 28 quarts of milk a week to Mary's house. How many quarts did he deliver in 4 weeks? $4 \times 28 = \square$ 112 quarts Multiply; sets of equal size are joined
3. John walked 5 blocks in 15 minutes. How long did it take him to walk one block? $15 \div 5 = \square$ 3 minutes
Divide; find how many in each equal group
4. There were 3 third-grade classes in the Barton School. There were 35 children in each class. How many children were there in all the third-grade classes in Barton School? $3 \times 35 = \square$ 105 children Multiply; sets of equal size are joined
5. A grocer had 559 pounds of beans. He put them into bags holding 5 pounds each. How many bags did he fill and how many pounds of beans remained? $559 \div 5 = \square$ 111 bags and 4 pounds Divide; find how many equal groups
6. The Brownie Troop made 646 pieces of fudge for a sale. If they put 3 pieces of fudge in a bag, how many bags can they fill? How many pieces will remain?
 $646 \div 3 = \square$ 215 bags, 1 piece Divide; find how many equal groups.

Written Solve problems 1 through 6 above.

See above.

Checkup Time

The numerals in () tell the pages where you can turn for help if you need it.

Important Ideas

1. You can use what you know about multiplication to help you check division. (276)

2. You multiply tens as you multiply ones. (277)

3. Multiplication and division are distributive over addition, that is $2 \times (10 + 4) = 20 + 8$ and $(50 + 5) \div 5 = 10 + 1$. (279, 290)

4. You multiply hundreds as you multiply ones and tens. (284)

5. You divide hundreds as you divide ones and tens. (295)

Questions to Discuss

See T299 for answers.

1. How does skip counting help you find the product of a multiplication? (276)

2. How does knowing a help you know b and c below? (277, 284)

a	b	c
$2 \times 1 = 2$	$2 \times 10 = 20$	$2 \times 100 = 200$

3. How does knowing a help you know b and c below? (295, 296)

a	b	c
$6 \div 2 = 3$	$60 \div 2 = 30$	$600 \div 2 = 300$

4. What steps were used in the division at the right? In which steps was there a remainder? (293, 294, 295)

17 r1
2 $\overline{)35}$
-2
15
-14
1

Written Practice

Solve each problem. (286, 298)

1. On a trip, Peter's father drove 235 miles each day for 3 days. How many miles did he drive in the three days? $3 \times 235 = \square$

705 miles

2. Paul and his brother sold 366 tickets for the school fair. If each boy sold the same number, how many tickets did each boy sell? $366 \div 2 = \square$ 183 tickets

3. Janet had a roll of ribbon that held 75 feet. How many pieces, each 6 feet long can she cut from the roll? How many feet of ribbon will be left? $75 \div 6 = \square$
12 pieces and 3 feet left over

Self-Evaluation

Part 1 Copy. Write each sum or difference. Check.

- | a | b |
|--|--|
| 1. $88 - 35 = \square$ 53 | $51 - 29 = \square$ 22 |
| 2. $104 + 372 = \square$ 476 | $4783 + 2169 = \square$ 6952 |
| 3. $436 - 141 = \square$ 295 | $5264 - 2895 = \square$ 2369 |
| 4. $572 + 256 = \square$ 828 | $3549 + 2118 = \square$ 5667 |
| 5. $309 + 291 = \square$ 600 | $2994 + 3006 = \square$ 6000 |
| 6. $250 - 132 = \square$ 118 | $3072 - 1351 = \square$ 1721 |
| 7. $800 - 357 = \square$ 443 | $7362 - 2108 = \square$ 5254 |
| 8. $421 + 259 = \square$ 680 | $3359 + 2683 = \square$ 6042 |

Part 2 Copy. Write each product or quotient.

- | a | b | c |
|--|---|---|
| 1. $\begin{array}{r} 21 \\ \times 4 \\ \hline 84 \end{array}$ | $\begin{array}{r} 25 \\ \times 3 \\ \hline 75 \end{array}$ | $\begin{array}{r} 36 \\ \times 4 \\ \hline 144 \end{array}$ |
| 2. $\begin{array}{r} 121 \\ \times 4 \\ \hline 484 \end{array}$ | $\begin{array}{r} 74 \\ \times 2 \\ \hline 148 \end{array}$ | $\begin{array}{r} 222 \\ \times 2 \\ \hline 444 \end{array}$ |
| 3. $5 \overline{)10} \begin{array}{l} 2 \\ 5r2 \end{array}$ | $4 \overline{)21} \begin{array}{l} 5r1 \end{array}$ | $6 \overline{)18} \begin{array}{l} 3 \end{array}$ |
| 4. $5 \overline{)27} \begin{array}{l} 5r2 \\ 123 \end{array}$ | $4 \overline{)84} \begin{array}{l} 21 \\ 211 \end{array}$ | $3 \overline{)96} \begin{array}{l} 32 \\ 111 \end{array}$ |
| 5. $3 \overline{)369} \begin{array}{l} 123 \\ 226r2 \end{array}$ | $4 \overline{)844} \begin{array}{l} 211 \\ 177r2 \end{array}$ | $5 \overline{)555} \begin{array}{l} 111 \\ 164r4 \end{array}$ |
| 6. $4 \overline{)906} \begin{array}{l} 226r2 \end{array}$ | $3 \overline{)533} \begin{array}{l} 177r2 \end{array}$ | $5 \overline{)824} \begin{array}{l} 164r4 \end{array}$ |

Part 3 Write each problem in the language of arithmetic. Solve it.

1. At the park, the gardeners are to plant 624 rosebushes in 4 plots of ground. If they put the same number in each, how many rosebushes will go in each plot?
 $624 \div 4 = \square$ 156 rosebushes

2. The Cub Scouts planted 786 trees in 5 rows with the same number of trees in each row. How many trees were in each row? How many were left over?
 $786 \div 5 = \square$ 157 trees and 1 left over

3. Ann's mother bought Ann a dress for \$16.98, gloves for \$1.95, a hat for \$2.45, and shoes for \$10.98. How much did she spend for Ann's clothes?
 $16.98 + 1.95 + 2.45 + 10.98 = \square$ \$32.36

4. Marvin's father bought a hand drill for \$12.95. Later he saw a similar drill on sale for \$9.88. How much would he have saved by waiting for the sale?
 $12.95 - 9.88 = \square$ \$3.07

5. 474 pupils from each of 3 schools went to see *Hansel and Gretel* at the city auditorium. How many pupils from all 3 schools attended the operetta?
 $3 \times 474 = \square$ 1422 pupils

You can review the many important ideas you have learned this year by reading each statement in a blue rectangle. Practice using these ideas by completing the exercises in this chapter. The practice may be oral or written, whichever your teacher thinks will help you most. Before you do the exercises in each practice lesson, read the statement that tells you about it and study the example.

Reviewing Numbers and Numerals

Counting numbers and number words tell *how many*.

x	xx	xxx
1	2	3
one	two	three

Use with pages 5 and 6.

1. Which counting number comes after 2? 3? 4? 7? 8?

3; 4; 5; 8; 9

2. Which set of X's below matches 5? 6? 8? c; a; b

a	b	c
xxxxxx	xxxxxxxx	xxxxx

3. Which numeral can you use in place of the number word five? Six? Seven? 5; 6; 7

Numerals may be used to tell position in a series.

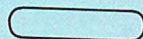
D	E	F	G
1st	2nd	3rd	4th

Use with page 7.

1. Name the third and fifth letters in this row: A B C D E F.

2. Write the name of the first day of this month. *Answers will vary.*

0 is the number of the empty set.



Use with page 8.

1. Write a zero correctly. 0

2. Write the numeral that tells *how many* in each set below.

a	b	c
(x) 1	0 0	(xx) 2

The value of a digit depends on its position in a numeral.

T	0	
1	-----	1 one
1	-----	1 ten and 1 one

Use with pages 10 and 11.

1. Write each of these numerals on grids.

a	b	c	d
12 $\frac{T0}{12}$	14 $\frac{T0}{14}$	17 $\frac{T0}{17}$	19 $\frac{T0}{19}$

2. Write the following as two-digit numerals: sixteen, twenty.

16; 20

Finding Sums Through 9

When you are to put sets together, you may add the numbers of the sets in either order.

$$\begin{array}{l} \textcircled{XX} \textcircled{XXX} \quad 3+2=2+3=\square \\ \textcircled{XXXXX} \quad 3+2=2+3=5 \end{array}$$

Use with pages 17 through 20.

- | | |
|--|---|
| $\begin{array}{l} a \\ 1. \quad 3+1=\square \\ 2. \quad 1+6=\square \\ 3. \quad 4+1=\square \\ 4. \quad 2+5=\square \\ 5. \quad 3+3=\square \\ 6. \quad 1+1=\square \\ 7. \quad 3+4=\square \end{array}$ | $\begin{array}{l} b \\ 2+3=\square \\ 4+2=\square \\ 5+1=\square \\ 6+1=\square \\ 5+2=\square \\ 1+4=\square \\ 4+3=\square \end{array}$ |
|--|---|

Use with page 21.

- | | | | |
|--|--|--|--|
| $\begin{array}{l} a \\ 1. \quad \begin{array}{r} 4 \\ +4 \\ \hline 8 \end{array} \\ 2. \quad \begin{array}{r} 5 \\ +4 \\ \hline 9 \end{array} \\ 3. \quad \begin{array}{r} 1 \\ +8 \\ \hline 9 \end{array} \\ 4. \quad \begin{array}{r} 6 \\ +3 \\ \hline 9 \end{array} \end{array}$ | $\begin{array}{l} b \\ \begin{array}{r} 4 \\ +5 \\ \hline 9 \end{array} \\ \begin{array}{r} 3 \\ +5 \\ \hline 8 \end{array} \\ \begin{array}{r} 7 \\ +2 \\ \hline 9 \end{array} \\ \begin{array}{r} 5 \\ +3 \\ \hline 8 \end{array} \end{array}$ | $\begin{array}{l} c \\ \begin{array}{r} 2 \\ +7 \\ \hline 9 \end{array} \\ \begin{array}{r} 7 \\ +1 \\ \hline 8 \end{array} \\ \begin{array}{r} 3 \\ +6 \\ \hline 9 \end{array} \\ \begin{array}{r} 2 \\ +5 \\ \hline 7 \end{array} \end{array}$ | $\begin{array}{l} d \\ \begin{array}{r} 6 \\ +2 \\ \hline 8 \end{array} \\ \begin{array}{r} 1 \\ +7 \\ \hline 8 \end{array} \\ \begin{array}{r} 2 \\ +6 \\ \hline 8 \end{array} \\ \begin{array}{r} 8 \\ +1 \\ \hline 9 \end{array} \end{array}$ |
|--|--|--|--|

Only two numbers can be added at a time but in any order and with any grouping.

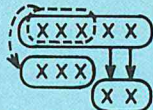
$$\begin{array}{rcl} 4 & \xleftarrow{\quad} & 4 \\ 5 & \xleftarrow{\quad} & 2 \\ \hline 9 & & 9 \end{array} \quad \begin{array}{l} \xrightarrow{\quad} 6 \\ \xrightarrow{\quad} 3 \\ \hline 9 \end{array}$$

Use with pages 24, 26, and 27.

- | | | | |
|--|---|---|---|
| $\begin{array}{l} a \\ 1. \quad \begin{array}{r} 4 \\ 3 \\ +1 \\ \hline 8 \end{array} \\ 2. \quad \begin{array}{r} 2 \\ 3 \\ +2 \\ \hline 7 \end{array} \\ 3. \quad \begin{array}{r} 2 \\ 1 \\ +6 \\ \hline 9 \end{array} \\ 4. \quad \begin{array}{r} 5 \\ 2 \\ +1 \\ \hline 8 \end{array} \\ 5. \quad \begin{array}{r} 1 \\ 6 \\ +1 \\ \hline 8 \end{array} \\ 6. \quad \begin{array}{r} 4 \\ 3 \\ +0 \\ \hline 7 \end{array} \\ 7. \quad \begin{array}{r} 7 \\ 0 \\ +1 \\ \hline 8 \end{array} \end{array}$ | $\begin{array}{l} b \\ \begin{array}{r} 3 \\ 1 \\ +3 \\ \hline 7 \end{array} \\ \begin{array}{r} 1 \\ 5 \\ +1 \\ \hline 7 \end{array} \\ \begin{array}{r} 3 \\ 2 \\ +4 \\ \hline 9 \end{array} \\ \begin{array}{r} 3 \\ 5 \\ +1 \\ \hline 9 \end{array} \\ \begin{array}{r} 4 \\ 1 \\ +4 \\ \hline 9 \end{array} \\ \begin{array}{r} 6 \\ 0 \\ +1 \\ \hline 7 \end{array} \\ \begin{array}{r} 3 \\ 0 \\ +6 \\ \hline 9 \end{array} \end{array}$ | $\begin{array}{l} c \\ \begin{array}{r} 6 \\ 1 \\ +2 \\ \hline 9 \end{array} \\ \begin{array}{r} 3 \\ 4 \\ +1 \\ \hline 8 \end{array} \\ \begin{array}{r} 7 \\ 1 \\ +1 \\ \hline 9 \end{array} \\ \begin{array}{r} 4 \\ 2 \\ +2 \\ \hline 8 \end{array} \\ \begin{array}{r} 3 \\ 1 \\ +4 \\ \hline 8 \end{array} \\ \begin{array}{r} 5 \\ 2 \\ +0 \\ \hline 7 \end{array} \\ \begin{array}{r} 0 \\ 1 \\ +8 \\ \hline 9 \end{array} \end{array}$ | $\begin{array}{l} d \\ \begin{array}{r} 5 \\ 1 \\ +2 \\ \hline 8 \end{array} \\ \begin{array}{r} 4 \\ 1 \\ +3 \\ \hline 8 \end{array} \\ \begin{array}{r} 6 \\ 1 \\ +1 \\ \hline 8 \end{array} \\ \begin{array}{r} 3 \\ 4 \\ +1 \\ \hline 8 \end{array} \\ \begin{array}{r} 2 \\ 5 \\ +1 \\ \hline 8 \end{array} \\ \begin{array}{r} 0 \\ 5 \\ +4 \\ \hline 9 \end{array} \\ \begin{array}{r} 2 \\ 0 \\ +5 \\ \hline 7 \end{array} \end{array}$ |
|--|---|---|---|

Subtraction with Minuends of 9 or Less

When you are to take a set apart to find how many are left, subtract.



$$5 - 3 = \square$$

$$5 - 3 = 2$$

Use with pages 33 and 34.

$$1. \quad \begin{array}{r} a \\ 5 - 1 = \square \end{array}$$

$$2. \quad \begin{array}{r} 3 \\ 3 - 1 = \square \end{array}$$

$$3. \quad \begin{array}{r} 2 \\ 4 - 2 = \square \end{array}$$

$$4. \quad \begin{array}{r} 1 \\ 5 - 4 = \square \end{array}$$

$$5. \quad \begin{array}{r} 2 \\ 5 - 3 = \square \end{array}$$

$$6. \quad \begin{array}{r} 1 \\ 5 - \square = 4 \end{array}$$

$$7. \quad \begin{array}{r} 3 \\ 5 - \square = 2 \end{array}$$

$$8. \quad \begin{array}{r} 2 \\ 4 - \square = 2 \end{array}$$

$$9. \quad \begin{array}{r} 2 \\ 3 - \square = 1 \end{array}$$

$$b \quad \begin{array}{r} 1 \\ 4 - 3 = \square \end{array}$$

$$5 - 2 = \square$$

$$3 - 2 = \square$$

$$2 - 1 = \square$$

$$4 - 1 = \square$$

$$3 - \square = 2$$

$$5 - \square = 1$$

$$4 - \square = 1$$

$$5 - \square = 3$$

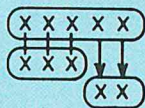
Use with page 35.

$$1. \quad \begin{array}{r} a \\ 6 \\ -3 \\ \hline 3 \end{array} \quad \begin{array}{r} b \\ 7 \\ -1 \\ \hline 6 \end{array} \quad \begin{array}{r} c \\ 7 \\ -5 \\ \hline 2 \end{array} \quad \begin{array}{r} d \\ 6 \\ -1 \\ \hline 5 \end{array}$$

$$2. \quad \begin{array}{r} 7 \\ -4 \\ \hline 3 \end{array} \quad \begin{array}{r} 7 \\ -6 \\ \hline 1 \end{array} \quad \begin{array}{r} 6 \\ -2 \\ \hline 4 \end{array} \quad \begin{array}{r} 6 \\ -5 \\ \hline 1 \end{array}$$

$$3. \quad \begin{array}{r} 7 \\ -2 \\ \hline 5 \end{array} \quad \begin{array}{r} 7 \\ -3 \\ \hline 4 \end{array} \quad \begin{array}{r} 6 \\ -4 \\ \hline 2 \end{array} \quad \begin{array}{r} 5 \\ -4 \\ \hline 1 \end{array}$$

When you are to compare two groups, or sets, to find by how many one set is greater than the other, subtract.



$$5 - 3 = \square$$

$$5 - 3 = 2$$

Use with pages 38 and 39.

$$1. \quad \begin{array}{r} a \\ 8 \\ -6 \\ \hline 2 \end{array} \quad \begin{array}{r} b \\ 9 \\ -2 \\ \hline 7 \end{array} \quad \begin{array}{r} c \\ 8 \\ -1 \\ \hline 7 \end{array} \quad \begin{array}{r} d \\ 7 \\ -4 \\ \hline 3 \end{array}$$

$$2. \quad \begin{array}{r} 9 \\ -4 \\ \hline 5 \end{array} \quad \begin{array}{r} 8 \\ -4 \\ \hline 4 \end{array} \quad \begin{array}{r} 9 \\ -1 \\ \hline 8 \end{array} \quad \begin{array}{r} 9 \\ -6 \\ \hline 3 \end{array}$$

$$3. \quad \begin{array}{r} 9 \\ -7 \\ \hline 2 \end{array} \quad \begin{array}{r} 8 \\ -2 \\ \hline 6 \end{array} \quad \begin{array}{r} 8 \\ -7 \\ \hline 1 \end{array} \quad \begin{array}{r} 9 \\ -5 \\ \hline 4 \end{array}$$

$$4. \quad \begin{array}{r} 8 \\ -5 \\ \hline 3 \end{array} \quad \begin{array}{r} 8 \\ -3 \\ \hline 5 \end{array} \quad \begin{array}{r} 9 \\ -3 \\ \hline 6 \end{array} \quad \begin{array}{r} 9 \\ -8 \\ \hline 1 \end{array}$$

Any number minus itself equals 0.

$$1 - 1 = 0$$

$$2 - 2 = 0$$

Use with page 46.

$$1. \quad \begin{array}{r} a \\ 6 - 6 = \square \end{array} \quad \begin{array}{r} b \\ 5 - 5 = \square \end{array}$$

$$2. \quad \begin{array}{r} 8 - 8 = \square \end{array} \quad \begin{array}{r} 7 - 7 = \square \end{array}$$

$$3. \quad \begin{array}{r} 9 - 9 = \square \end{array} \quad \begin{array}{r} 4 - 4 = \square \end{array}$$

$$4. \quad \begin{array}{r} 3 - 3 = \square \end{array} \quad \begin{array}{r} 2 - 2 = \square \end{array}$$

$$5. \quad \begin{array}{r} 8 - \square = 0 \end{array} \quad \begin{array}{r} 4 - \square = 0 \end{array}$$

Addition and Subtraction Combinations of 10 Through 18

Changing the order of addends does not change the sum.

$$4 + 9 = 13$$

$$9 + 4 = 13$$

Use with pages 50 through 55.

	<i>a</i>	<i>b</i>	<i>c</i>	<i>d</i>	<i>e</i>
1.	$\begin{array}{r} 8 \\ +4 \\ \hline 12 \end{array}$	$\begin{array}{r} 4 \\ +8 \\ \hline 12 \end{array}$	$\begin{array}{r} 6 \\ +9 \\ \hline 15 \end{array}$	$\begin{array}{r} 9 \\ +6 \\ \hline 15 \end{array}$	$\begin{array}{r} 5 \\ +7 \\ \hline 12 \end{array}$
2.	$\begin{array}{r} 7 \\ +6 \\ \hline 13 \end{array}$	$\begin{array}{r} 6 \\ +7 \\ \hline 13 \end{array}$	$\begin{array}{r} 8 \\ +7 \\ \hline 15 \end{array}$	$\begin{array}{r} 7 \\ +8 \\ \hline 15 \end{array}$	$\begin{array}{r} 7 \\ +5 \\ \hline 12 \end{array}$
3.	$\begin{array}{r} 9 \\ +3 \\ \hline 12 \end{array}$	$\begin{array}{r} 3 \\ +9 \\ \hline 12 \end{array}$	$\begin{array}{r} 6 \\ +4 \\ \hline 10 \end{array}$	$\begin{array}{r} 4 \\ +6 \\ \hline 10 \end{array}$	$\begin{array}{r} 5 \\ +9 \\ \hline 14 \end{array}$
4.	$\begin{array}{r} 5 \\ +8 \\ \hline 13 \end{array}$	$\begin{array}{r} 8 \\ +5 \\ \hline 13 \end{array}$	$\begin{array}{r} 6 \\ +9 \\ \hline 15 \end{array}$	$\begin{array}{r} 9 \\ +7 \\ \hline 16 \end{array}$	$\begin{array}{r} 9 \\ +5 \\ \hline 14 \end{array}$
5.	$\begin{array}{r} 8 \\ +6 \\ \hline 14 \end{array}$	$\begin{array}{r} 6 \\ +8 \\ \hline 14 \end{array}$	$\begin{array}{r} 8 \\ +9 \\ \hline 17 \end{array}$	$\begin{array}{r} 8 \\ +8 \\ \hline 16 \end{array}$	$\begin{array}{r} 9 \\ +9 \\ \hline 18 \end{array}$

Subtraction is the inverse operation of addition.

$$5 + 5 = 10$$

$$10 - 5 = 5$$

Use with pages 63 and 64.

	<i>a</i>	<i>b</i>	<i>c</i>	<i>d</i>
1.	$\begin{array}{r} 8 \\ +2 \\ \hline 10 \end{array}$	$\begin{array}{r} 10 \\ -2 \\ \hline 8 \end{array}$	$\begin{array}{r} 2 \\ +8 \\ \hline 10 \end{array}$	$\begin{array}{r} 10 \\ -8 \\ \hline 2 \end{array}$
2.	$\begin{array}{r} 7 \\ +3 \\ \hline 10 \end{array}$	$\begin{array}{r} 10 \\ -3 \\ \hline 7 \end{array}$	$\begin{array}{r} 3 \\ +7 \\ \hline 10 \end{array}$	$\begin{array}{r} 10 \\ -7 \\ \hline 3 \end{array}$

	<i>a</i>	<i>b</i>	<i>c</i>	<i>d</i>
3.	$\begin{array}{r} 9 \\ +2 \\ \hline 11 \end{array}$	$\begin{array}{r} 11 \\ -2 \\ \hline 9 \end{array}$	$\begin{array}{r} 2 \\ +9 \\ \hline 11 \end{array}$	$\begin{array}{r} 11 \\ -9 \\ \hline 2 \end{array}$
4.	$\begin{array}{r} 4 \\ +7 \\ \hline 11 \end{array}$	$\begin{array}{r} 11 \\ -7 \\ \hline 4 \end{array}$	$\begin{array}{r} 7 \\ +4 \\ \hline 11 \end{array}$	$\begin{array}{r} 11 \\ -4 \\ \hline 7 \end{array}$
5.	$\begin{array}{r} 6 \\ +4 \\ \hline 10 \end{array}$	$\begin{array}{r} 10 \\ -4 \\ \hline 6 \end{array}$	$\begin{array}{r} 4 \\ +6 \\ \hline 10 \end{array}$	$\begin{array}{r} 10 \\ -6 \\ \hline 4 \end{array}$
6.	$\begin{array}{r} 5 \\ +6 \\ \hline 11 \end{array}$	$\begin{array}{r} 11 \\ -6 \\ \hline 5 \end{array}$	$\begin{array}{r} 6 \\ +5 \\ \hline 11 \end{array}$	$\begin{array}{r} 11 \\ -5 \\ \hline 6 \end{array}$
7.	$\begin{array}{r} 8 \\ +3 \\ \hline 11 \end{array}$	$\begin{array}{r} 11 \\ -3 \\ \hline 8 \end{array}$	$\begin{array}{r} 3 \\ +8 \\ \hline 11 \end{array}$	$\begin{array}{r} 11 \\ -8 \\ \hline 3 \end{array}$

Use with pages 65 through 68.

	<i>a</i>	<i>b</i>	<i>c</i>	<i>d</i>	<i>e</i>
1.	$\begin{array}{r} 12 \\ -3 \\ \hline 9 \end{array}$	$\begin{array}{r} 13 \\ -7 \\ \hline 6 \end{array}$	$\begin{array}{r} 16 \\ -8 \\ \hline 8 \end{array}$	$\begin{array}{r} 12 \\ -6 \\ \hline 6 \end{array}$	$\begin{array}{r} 14 \\ -8 \\ \hline 6 \end{array}$
2.	$\begin{array}{r} 13 \\ -4 \\ \hline 9 \end{array}$	$\begin{array}{r} 17 \\ -8 \\ \hline 9 \end{array}$	$\begin{array}{r} 16 \\ -7 \\ \hline 9 \end{array}$	$\begin{array}{r} 12 \\ -5 \\ \hline 7 \end{array}$	$\begin{array}{r} 14 \\ -5 \\ \hline 9 \end{array}$
3.	$\begin{array}{r} 12 \\ -7 \\ \hline 5 \end{array}$	$\begin{array}{r} 15 \\ -6 \\ \hline 9 \end{array}$	$\begin{array}{r} 12 \\ -4 \\ \hline 8 \end{array}$	$\begin{array}{r} 18 \\ -9 \\ \hline 9 \end{array}$	$\begin{array}{r} 13 \\ -6 \\ \hline 7 \end{array}$
4.	$\begin{array}{r} 17 \\ -9 \\ \hline 8 \end{array}$	$\begin{array}{r} 16 \\ -9 \\ \hline 7 \end{array}$	$\begin{array}{r} 15 \\ -7 \\ \hline 8 \end{array}$	$\begin{array}{r} 12 \\ -9 \\ \hline 3 \end{array}$	$\begin{array}{r} 14 \\ -6 \\ \hline 8 \end{array}$
5.	$\begin{array}{r} 14 \\ -9 \\ \hline 5 \end{array}$	$\begin{array}{r} 12 \\ -8 \\ \hline 4 \end{array}$	$\begin{array}{r} 13 \\ -5 \\ \hline 8 \end{array}$	$\begin{array}{r} 14 \\ -7 \\ \hline 7 \end{array}$	$\begin{array}{r} 13 \\ -9 \\ \hline 4 \end{array}$
6.	$\begin{array}{r} 15 \\ -8 \\ \hline 7 \end{array}$	$\begin{array}{r} 15 \\ -9 \\ \hline 6 \end{array}$	$\begin{array}{r} 13 \\ -8 \\ \hline 5 \end{array}$	$\begin{array}{r} 12 \\ -5 \\ \hline 7 \end{array}$	$\begin{array}{r} 11 \\ -9 \\ \hline 2 \end{array}$

Adding One-Digit to Two-Digit Numbers

A. When the sum of the ones is less than 10, add the ones and write the tens as part of the sum.

$$\begin{array}{r|l} \text{T} & \text{O} \\ 2 & 3 \\ + & 2 \\ \hline 2 & 5 \end{array}$$

$$23 + 2 = \square$$

$$23 + 2 = 25$$

Use with pages 77 and 78.

	<i>a</i>	<i>b</i>	<i>c</i>	<i>d</i>
1.	$\begin{array}{r} 24 \\ +5 \\ \hline 29 \end{array}$	$\begin{array}{r} 13 \\ +4 \\ \hline 17 \end{array}$	$\begin{array}{r} 52 \\ +7 \\ \hline 59 \end{array}$	$\begin{array}{r} 60 \\ +5 \\ \hline 65 \end{array}$
2.	$\begin{array}{r} 75 \\ +2 \\ \hline 77 \end{array}$	$\begin{array}{r} 23 \\ +6 \\ \hline 29 \end{array}$	$\begin{array}{r} 4 \\ +33 \\ \hline 37 \end{array}$	$\begin{array}{r} 25 \\ +3 \\ \hline 28 \end{array}$
3.	$\begin{array}{r} 36 \\ +3 \\ \hline 39 \end{array}$	$\begin{array}{r} 5 \\ +44 \\ \hline 49 \end{array}$	$\begin{array}{r} 9 \\ +20 \\ \hline 29 \end{array}$	$\begin{array}{r} 42 \\ +6 \\ \hline 48 \end{array}$

B. When the sum of the ones is greater than 9, change the form of each 10 ones to 1 ten, and add the tens.

$$\begin{array}{r|l} \text{T} & \text{O} \\ 3 & 7 \\ + & 6 \\ \hline 4 & 3 \end{array}$$

$$37 + 6 = \square$$

$$37 + 6 = 43$$

Use with pages 82 and 83.

	<i>a</i>	<i>b</i>	<i>c</i>	<i>d</i>
1.	$\begin{array}{r} 54 \\ +7 \\ \hline 61 \end{array}$	$\begin{array}{r} 89 \\ +5 \\ \hline 94 \end{array}$	$\begin{array}{r} 76 \\ +7 \\ \hline 83 \end{array}$	$\begin{array}{r} 7 \\ +63 \\ \hline 70 \end{array}$
2.	$\begin{array}{r} 84 \\ +9 \\ \hline 93 \end{array}$	$\begin{array}{r} 58 \\ +6 \\ \hline 64 \end{array}$	$\begin{array}{r} 5 \\ +28 \\ \hline 33 \end{array}$	$\begin{array}{r} 48 \\ +4 \\ \hline 52 \end{array}$

C. When you add more than 2 addends, you add only 2 numbers at a time but you may use any order or grouping of numbers.

$$\begin{array}{ccccccc} & & 26 & \leftarrow & 24 & \rightarrow & 24 & \rightarrow & 24 \\ 27 & \leftarrow & (& 2 & \rightarrow & 2 &) & \rightarrow & 5 \\ & & 1 & \leftarrow & 1 & & & & \\ 2 & \leftarrow & 2 & \leftarrow & +2 & \rightarrow & 3 & & \\ \hline 29 & & & & 29 & & & & 29 \end{array}$$

Use with page 86.

- $2 + 1 + 2 + 3 = \square$ ⁸
- $6 + 1 + 1 + 0 = \square$ ⁸
- $3 + 1 + 4 + 1 = \square$ ⁹
- $5 + 1 + 0 + 2 = \square$ ⁸
- $3 + 1 + 2 + 3 = \square$ ⁹
- $2 + 0 + 3 + 4 = \square$ ⁹

Use with pages 87 and 89.

- $24 + 2 + 1 + 2 = \square$ ²⁹
- $31 + 4 + 2 + 1 = \square$ ³⁸
- $2 + 23 + 0 + 2 = \square$ ²⁷
- $16 + 2 + 4 + 1 = \square$ ²³
- $3 + 5 + 22 + 6 = \square$ ³⁶
- $16 + 4 + 3 + 2 = \square$ ²⁵
- $5 + 4 + 73 + 6 = \square$ ⁸⁸

Adding Two-Digit Numbers

Add tens in the same way you add ones.

$\begin{array}{r} \text{T} \text{ } 0 \\ 23 \\ +34 \\ \hline 57 \end{array}$	$\begin{array}{r} 12 \\ 14 \\ +13 \\ \hline 39 \end{array}$	$\begin{array}{r} 43 \\ 17 \\ +28 \\ \hline 88 \end{array}$
--	---	---

Use with pages 93 and 94.

	<i>a</i>	<i>b</i>	<i>c</i>	<i>d</i>
1.	$\begin{array}{r} 82 \\ +16 \\ \hline 98 \end{array}$	$\begin{array}{r} 33 \\ +32 \\ \hline 65 \end{array}$	$\begin{array}{r} 49 \\ +20 \\ \hline 69 \end{array}$	$\begin{array}{r} 26 \\ +23 \\ \hline 49 \end{array}$
2.	$\begin{array}{r} 65 \\ +22 \\ \hline 87 \end{array}$	$\begin{array}{r} 70 \\ +20 \\ \hline 90 \end{array}$	$\begin{array}{r} 52 \\ +34 \\ \hline 86 \end{array}$	$\begin{array}{r} 20 \\ +58 \\ \hline 78 \end{array}$
3.	$\begin{array}{r} 13 \\ 21 \\ +12 \\ \hline 46 \end{array}$	$\begin{array}{r} 31 \\ 45 \\ +12 \\ \hline 88 \end{array}$	$\begin{array}{r} 26 \\ 30 \\ +23 \\ \hline 79 \end{array}$	$\begin{array}{r} 42 \\ 12 \\ +34 \\ \hline 88 \end{array}$
4.	$\begin{array}{r} 35 \\ 53 \\ +10 \\ \hline 98 \end{array}$	$\begin{array}{r} 54 \\ 24 \\ +10 \\ \hline 88 \end{array}$	$\begin{array}{r} 67 \\ 10 \\ +21 \\ \hline 98 \end{array}$	$\begin{array}{r} 18 \\ 70 \\ +11 \\ \hline 99 \end{array}$

Use with page 96.

	<i>a</i>	<i>b</i>	<i>c</i>	<i>d</i>
1.	$\begin{array}{r} 36 \\ +48 \\ \hline 84 \end{array}$	$\begin{array}{r} 69 \\ +17 \\ \hline 86 \end{array}$	$\begin{array}{r} 48 \\ +27 \\ \hline 75 \end{array}$	$\begin{array}{r} 26 \\ +24 \\ \hline 50 \end{array}$
2.	$\begin{array}{r} 45 \\ +45 \\ \hline 90 \end{array}$	$\begin{array}{r} 54 \\ +19 \\ \hline 73 \end{array}$	$\begin{array}{r} 59 \\ +39 \\ \hline 98 \end{array}$	$\begin{array}{r} 24 \\ +38 \\ \hline 62 \end{array}$
3.	$\begin{array}{r} 29 \\ +65 \\ \hline 94 \end{array}$	$\begin{array}{r} 38 \\ +28 \\ \hline 66 \end{array}$	$\begin{array}{r} 25 \\ +47 \\ \hline 72 \end{array}$	$\begin{array}{r} 16 \\ +69 \\ \hline 85 \end{array}$
4.	$\begin{array}{r} 29 \\ +52 \\ \hline 81 \end{array}$	$\begin{array}{r} 37 \\ +37 \\ \hline 74 \end{array}$	$\begin{array}{r} 59 \\ +24 \\ \hline 83 \end{array}$	$\begin{array}{r} 44 \\ +37 \\ \hline 81 \end{array}$

Use with page 98.

1. $21 + 14 + 45 = \square$ 80
2. $63 + 10 + 14 = \square$ 87
3. $12 + 55 + 26 = \square$ 93
4. $46 + 27 + 20 = \square$ 93
5. $35 + 26 + 28 = \square$ 89
6. $57 + 28 + 10 = \square$ 95
7. $31 + 39 + 21 = \square$ 91
8. $62 + 11 + 17 = \square$ 90
9. $21 + 19 + 42 = \square$ 82
10. $57 + 12 + 11 = \square$ 80
11. $13 + 24 + 43 = \square$ 80
12. $44 + 19 + 24 = \square$ 87
13. $34 + 35 + 19 = \square$ 88
14. $65 + 13 + 18 = \square$ 96
15. $52 + 28 + 16 = \square$ 96
16. $47 + 17 + 26 = \square$ 90
17. $25 + 46 + 22 = \square$ 93
18. $13 + 61 + 18 = \square$ 92
19. $41 + 12 + 29 = \square$ 82
20. $33 + 23 + 15 = \square$ 71

Using Measures

Length is measured in units, such as the inch, the foot, and the yard.

$$1 \text{ foot} = 12 \text{ inches}$$

$$3 \text{ feet} = 36 \text{ inches}$$

$$1 \text{ yard} = 3 \text{ feet}$$

Use with pages 105 through 109.

- 2 yards = 6 feet.
- 2 yards = 72 inches.
- 2 feet = 24 inches.
- 43 inches + 29 inches = 72 inches.
- 2 feet + 4 feet = 6 feet.

Liquids are measured in units, such as the cup, the pint, the quart, and the gallon.

$$1 \text{ cup} = \frac{1}{2} \text{ pt.} \quad 2 \text{ pt.} = 1 \text{ qt.}$$

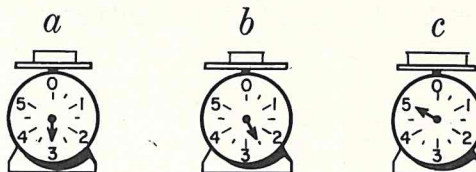
$$2 \text{ cups} = 1 \text{ pt.} \quad 4 \text{ qt.} = 1 \text{ gal.}$$

Use with pages 110 and 111.

- 1 quart = 4 cups.
- 1 gallon = 8 pints.
- 1 gallon = 16 cups.
- 6 pints = 12 cups.
- 8 cups = 2 quarts.
- 8 pints = 1 gallon.

Weight is measured in units, such as the pound and the ounce.

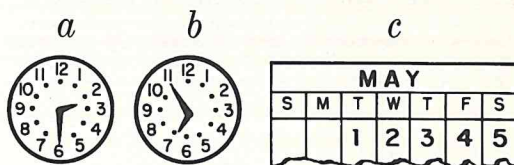
Use with pages 112 and 113.



- Scale *a* shows 3 lb.
- Scale *b* shows 2 $\frac{1}{2}$ lb.
- Scale *c* shows 5 lb.
- A pound of beans weighs 16 oz.

Time is measured in units, such as the minute, the hour, the day, the week, and the year.

Use with pages 114 through 118.



- The time on clock *a* is 2:30.
- The time on clock *b* is 6:55.
- The 3rd day of the week comes on Tuesday.
- The 3rd day in the month of May is on Thursday.
- Friday is the 6th day of the week.

Subtracting from Two-Digit Numbers

When there are more ones in the minuend than in the subtrahend, subtract the ones and write the tens as part of the difference.

$$\begin{array}{r} 27 \\ -5 \\ \hline 22 \end{array} \quad 27 - 5 = 22$$

Use with pages 125 and 126.

- | | <i>a</i> | | <i>b</i> |
|----|--------------------|--|--------------------|
| 1. | $36 - 5 = \square$ | | $98 - 4 = \square$ |
| 2. | $56 - 2 = \square$ | | $89 - 7 = \square$ |
| 3. | $75 - 2 = \square$ | | $29 - 5 = \square$ |
| 4. | $37 - 4 = \square$ | | $38 - 3 = \square$ |
| 5. | $96 - 1 = \square$ | | $87 - 3 = \square$ |

When there are more ones in the subtrahend than in the minuend, change the form of 1 ten to 10 ones.

$$\begin{array}{r} \text{T} | 0 \\ 32 \\ -5 \\ \hline 27 \end{array} \quad \begin{array}{l} 32 - 5 = \square \\ 32 - 5 = 27 \end{array}$$

Use with pages 127 and 128.

- | | <i>a</i> | <i>b</i> | <i>c</i> | <i>d</i> |
|----|--------------------|--------------------|--------------------|--------------------|
| 1. | $45 - 7 = \square$ | $56 - 9 = \square$ | $20 - 7 = \square$ | $83 - 9 = \square$ |
| 2. | $21 - 9 = \square$ | $33 - 6 = \square$ | $75 - 9 = \square$ | $32 - 5 = \square$ |

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You subtract tens in the same way you subtract ones.

$$\begin{array}{r} \text{T} | 0 \\ 95 \\ -72 \\ \hline 23 \end{array} \quad \begin{array}{r} \text{T} | 0 \\ 613 \\ -738 \\ \hline 35 \end{array}$$

Use with pages 129 and 131.

- | | <i>a</i> | <i>b</i> | <i>c</i> | <i>d</i> |
|----|---------------------|---------------------|---------------------|---------------------|
| 1. | $75 - 65 = \square$ | $65 - 21 = \square$ | $93 - 31 = \square$ | $55 - 34 = \square$ |
| 2. | $36 - 23 = \square$ | $87 - 71 = \square$ | $94 - 10 = \square$ | $93 - 23 = \square$ |
| 3. | $80 - 20 = \square$ | $42 - 30 = \square$ | $58 - 25 = \square$ | $79 - 37 = \square$ |
| 4. | $97 - 64 = \square$ | $68 - 63 = \square$ | $89 - 45 = \square$ | $78 - 26 = \square$ |

Use with pages 132 through 133.

- | | <i>a</i> | <i>b</i> | <i>c</i> | <i>d</i> |
|----|---------------------|---------------------|---------------------|---------------------|
| 1. | $63 - 47 = \square$ | $72 - 38 = \square$ | $40 - 29 = \square$ | $84 - 39 = \square$ |
| 2. | $72 - 29 = \square$ | $97 - 59 = \square$ | $91 - 19 = \square$ | $56 - 48 = \square$ |
| 3. | $62 - 27 = \square$ | $53 - 25 = \square$ | $94 - 38 = \square$ | $82 - 45 = \square$ |
| 4. | $82 - 54 = \square$ | $71 - 12 = \square$ | $84 - 35 = \square$ | $81 - 26 = \square$ |
| 5. | $90 - 25 = \square$ | $65 - 36 = \square$ | $71 - 44 = \square$ | $83 - 66 = \square$ |

Changing the Form of Tens in Addition

When the sum of the tens is greater than 9, change the form of each 10 tens to 1 hundred.

$$\begin{array}{r|l} \text{H} & \text{T} & \text{O} \\ \hline & 19 & 7 \\ + & 5 & \\ \hline 1 & 0 & 2 \end{array}$$

$$\begin{array}{r|l} \text{H} & \text{T} & \text{O} \\ \hline & 8 & 4 \\ + & 4 & 5 \\ \hline 1 & 2 & 9 \end{array}$$

$$\begin{array}{r|l} \text{H} & \text{T} & \text{O} \\ \hline & 16 & 7 \\ + & 5 & 8 \\ \hline 1 & 2 & 5 \end{array}$$

Use with page 149.

	<i>a</i>	<i>b</i>	<i>c</i>	<i>d</i>
1.	$\begin{array}{r} 94 \\ +6 \\ \hline 100 \end{array}$	$\begin{array}{r} 92 \\ +8 \\ \hline 100 \end{array}$	$\begin{array}{r} 96 \\ +7 \\ \hline 103 \end{array}$	$\begin{array}{r} 97 \\ +5 \\ \hline 102 \end{array}$
2.	$\begin{array}{r} 93 \\ +8 \\ \hline 101 \end{array}$	$\begin{array}{r} 5 \\ +98 \\ \hline 103 \end{array}$	$\begin{array}{r} 93 \\ +19 \\ \hline 112 \end{array}$	$\begin{array}{r} 7 \\ +99 \\ \hline 106 \end{array}$
3.	$\begin{array}{r} 93 \\ +7 \\ \hline 100 \end{array}$	$\begin{array}{r} 94 \\ +9 \\ \hline 103 \end{array}$	$\begin{array}{r} 97 \\ +6 \\ \hline 103 \end{array}$	$\begin{array}{r} 95 \\ +5 \\ \hline 100 \end{array}$
4.	$\begin{array}{r} 3 \\ +97 \\ \hline 100 \end{array}$	$\begin{array}{r} 96 \\ +4 \\ \hline 100 \end{array}$	$\begin{array}{r} 8 \\ +92 \\ \hline 100 \end{array}$	$\begin{array}{r} 98 \\ +5 \\ \hline 103 \end{array}$

Use with page 150.

	<i>a</i>	<i>b</i>	<i>c</i>	<i>d</i>
1.	$\begin{array}{r} 6 \\ 94 \\ +4 \\ \hline 104 \end{array}$	$\begin{array}{r} 92 \\ 7 \\ +6 \\ \hline 105 \end{array}$	$\begin{array}{r} 5 \\ 93 \\ +8 \\ \hline 106 \end{array}$	$\begin{array}{r} 99 \\ 1 \\ +7 \\ \hline 107 \end{array}$
2.	$\begin{array}{r} 5 \\ 4 \\ +96 \\ \hline 105 \end{array}$	$\begin{array}{r} 9 \\ 7 \\ +91 \\ \hline 107 \end{array}$	$\begin{array}{r} 92 \\ 6 \\ +8 \\ \hline 106 \end{array}$	$\begin{array}{r} 3 \\ 97 \\ +5 \\ \hline 105 \end{array}$
3.	$\begin{array}{r} 6 \\ 4 \\ +93 \\ \hline 103 \end{array}$	$\begin{array}{r} 1 \\ 99 \\ +6 \\ \hline 106 \end{array}$	$\begin{array}{r} 5 \\ 7 \\ +94 \\ \hline 106 \end{array}$	$\begin{array}{r} 2 \\ 98 \\ +6 \\ \hline 106 \end{array}$

Use with page 153.

	<i>a</i>	<i>b</i>	<i>c</i>	<i>d</i>
1.	$\begin{array}{r} 95 \\ +82 \\ \hline 177 \end{array}$	$\begin{array}{r} 26 \\ +93 \\ \hline 119 \end{array}$	$\begin{array}{r} 42 \\ +67 \\ \hline 109 \end{array}$	$\begin{array}{r} 54 \\ +53 \\ \hline 107 \end{array}$
2.	$\begin{array}{r} 32 \\ +74 \\ \hline 106 \end{array}$	$\begin{array}{r} 56 \\ +62 \\ \hline 118 \end{array}$	$\begin{array}{r} 87 \\ +72 \\ \hline 159 \end{array}$	$\begin{array}{r} 60 \\ +40 \\ \hline 100 \end{array}$
3.	$\begin{array}{r} 48 \\ +81 \\ \hline 129 \end{array}$	$\begin{array}{r} 63 \\ +94 \\ \hline 157 \end{array}$	$\begin{array}{r} 83 \\ +46 \\ \hline 129 \end{array}$	$\begin{array}{r} 72 \\ +67 \\ \hline 139 \end{array}$
4.	$\begin{array}{r} 69 \\ +75 \\ \hline 144 \end{array}$	$\begin{array}{r} 97 \\ +35 \\ \hline 132 \end{array}$	$\begin{array}{r} 88 \\ +88 \\ \hline 176 \end{array}$	$\begin{array}{r} 76 \\ +64 \\ \hline 140 \end{array}$
5.	$\begin{array}{r} 47 \\ +59 \\ \hline 106 \end{array}$	$\begin{array}{r} 95 \\ +75 \\ \hline 170 \end{array}$	$\begin{array}{r} 86 \\ +68 \\ \hline 154 \end{array}$	$\begin{array}{r} 78 \\ +87 \\ \hline 165 \end{array}$
6.	$\begin{array}{r} 69 \\ +98 \\ \hline 167 \end{array}$	$\begin{array}{r} 36 \\ +95 \\ \hline 131 \end{array}$	$\begin{array}{r} 49 \\ +96 \\ \hline 145 \end{array}$	$\begin{array}{r} 63 \\ +39 \\ \hline 102 \end{array}$

Use with page 156.

	<i>a</i>	<i>b</i>	<i>c</i>	<i>d</i>
1.	$\begin{array}{r} 31 \\ 19 \\ +91 \\ \hline 141 \end{array}$	$\begin{array}{r} 13 \\ 87 \\ +18 \\ \hline 118 \end{array}$	$\begin{array}{r} 52 \\ 28 \\ +22 \\ \hline 102 \end{array}$	$\begin{array}{r} 24 \\ 46 \\ +74 \\ \hline 144 \end{array}$
2.	$\begin{array}{r} 46 \\ 31 \\ +33 \\ \hline 110 \end{array}$	$\begin{array}{r} 65 \\ 45 \\ +55 \\ \hline 165 \end{array}$	$\begin{array}{r} 87 \\ 63 \\ +67 \\ \hline 217 \end{array}$	$\begin{array}{r} 78 \\ 52 \\ +76 \\ \hline 206 \end{array}$
3.	$\begin{array}{r} 17 \\ 21 \\ +83 \\ \hline 121 \end{array}$	$\begin{array}{r} 16 \\ 26 \\ +74 \\ \hline 116 \end{array}$	$\begin{array}{r} 71 \\ 32 \\ +38 \\ \hline 141 \end{array}$	$\begin{array}{r} 65 \\ 37 \\ +43 \\ \hline 145 \end{array}$
4.	$\begin{array}{r} 54 \\ 45 \\ +66 \\ \hline 165 \end{array}$	$\begin{array}{r} 52 \\ 64 \\ +48 \\ \hline 164 \end{array}$	$\begin{array}{r} 48 \\ 63 \\ +77 \\ \hline 188 \end{array}$	$\begin{array}{r} 83 \\ 78 \\ +32 \\ \hline 193 \end{array}$

Adding Numbers with Three or Four Digits

You add hundreds in the same way you add ones and tens.

$\begin{array}{r} \text{H} \text{T} \text{O} \\ 124 \\ +45 \\ \hline 169 \end{array}$	$\begin{array}{r} \text{H} \text{T} \text{O} \\ 138 \\ +71 \\ \hline 209 \end{array}$	$\begin{array}{r} \text{H} \text{T} \text{O} \\ 454 \\ +89 \\ \hline 543 \end{array}$	$\begin{array}{r} \text{H} \text{T} \text{O} \\ 179 \\ +375 \\ \hline 554 \end{array}$
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Use with pages 163 through 166.

<i>a</i>	<i>b</i>	<i>c</i>	<i>d</i>
1. $\begin{array}{r} 724 \\ +11 \\ \hline 735 \end{array}$	$\begin{array}{r} 316 \\ +23 \\ \hline 339 \end{array}$	$\begin{array}{r} 247 \\ +52 \\ \hline 299 \end{array}$	$\begin{array}{r} 145 \\ +31 \\ \hline 176 \end{array}$
2. $\begin{array}{r} 465 \\ +72 \\ \hline 537 \end{array}$	$\begin{array}{r} 840 \\ +92 \\ \hline 932 \end{array}$	$\begin{array}{r} 742 \\ +86 \\ \hline 828 \end{array}$	$\begin{array}{r} 376 \\ +30 \\ \hline 406 \end{array}$
3. $\begin{array}{r} 168 \\ +40 \\ \hline 208 \end{array}$	$\begin{array}{r} 680 \\ +45 \\ \hline 725 \end{array}$	$\begin{array}{r} 432 \\ +77 \\ \hline 509 \end{array}$	$\begin{array}{r} 622 \\ +83 \\ \hline 705 \end{array}$
4. $\begin{array}{r} 319 \\ +88 \\ \hline 407 \end{array}$	$\begin{array}{r} 627 \\ +76 \\ \hline 703 \end{array}$	$\begin{array}{r} 453 \\ +68 \\ \hline 521 \end{array}$	$\begin{array}{r} 268 \\ +69 \\ \hline 337 \end{array}$

Use with page 167.

<i>a</i>	<i>b</i>	<i>c</i>	<i>d</i>
1. $\begin{array}{r} 203 \\ +135 \\ \hline 338 \end{array}$	$\begin{array}{r} 420 \\ +535 \\ \hline 955 \end{array}$	$\begin{array}{r} 362 \\ +143 \\ \hline 505 \end{array}$	$\begin{array}{r} 592 \\ +235 \\ \hline 827 \end{array}$
2. $\begin{array}{r} 270 \\ +365 \\ \hline 635 \end{array}$	$\begin{array}{r} 767 \\ +180 \\ \hline 947 \end{array}$	$\begin{array}{r} 256 \\ +290 \\ \hline 546 \end{array}$	$\begin{array}{r} 570 \\ +299 \\ \hline 869 \end{array}$
3. $\begin{array}{r} 369 \\ +256 \\ \hline 625 \end{array}$	$\begin{array}{r} 278 \\ +652 \\ \hline 930 \end{array}$	$\begin{array}{r} 483 \\ +118 \\ \hline 601 \end{array}$	$\begin{array}{r} 555 \\ +168 \\ \hline 723 \end{array}$
4. $\begin{array}{r} 148 \\ 283 \\ +131 \\ \hline 562 \end{array}$	$\begin{array}{r} 366 \\ 136 \\ +206 \\ \hline 708 \end{array}$	$\begin{array}{r} 378 \\ 432 \\ +145 \\ \hline 955 \end{array}$	$\begin{array}{r} 489 \\ 121 \\ +206 \\ \hline 816 \end{array}$

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You add thousands in the same way you add ones, tens, and hundreds.

$\begin{array}{r} \text{Th} \text{H} \text{T} \text{O} \\ 925 \\ +620 \\ \hline 1545 \end{array}$	$\begin{array}{r} \text{Th} \text{H} \text{T} \text{O} \\ 1626 \\ +5985 \\ \hline 6611 \end{array}$	$\begin{array}{r} \text{Th} \text{H} \text{T} \text{O} \\ 5685 \\ +2397 \\ \hline 8082 \end{array}$
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Use with pages 174 through 177.

<i>a</i>	<i>b</i>	<i>c</i>
1. $\begin{array}{r} 757 \\ +340 \\ \hline 1097 \end{array}$	$\begin{array}{r} 874 \\ +203 \\ \hline 1077 \end{array}$	$\begin{array}{r} 770 \\ +609 \\ \hline 1379 \end{array}$
2. $\begin{array}{r} 489 \\ +621 \\ \hline 1110 \end{array}$	$\begin{array}{r} 578 \\ +432 \\ \hline 1010 \end{array}$	$\begin{array}{r} 366 \\ +736 \\ \hline 1102 \end{array}$
3. $\begin{array}{r} 2368 \\ +621 \\ \hline 2989 \end{array}$	$\begin{array}{r} 6375 \\ +232 \\ \hline 6607 \end{array}$	$\begin{array}{r} 489 \\ +6821 \\ \hline 7310 \end{array}$
4. $\begin{array}{r} 5463 \\ +778 \\ \hline 6241 \end{array}$	$\begin{array}{r} 2186 \\ +847 \\ \hline 3033 \end{array}$	$\begin{array}{r} 549 \\ +7684 \\ \hline 8233 \end{array}$

Use with pages 178 and 179.

<i>a</i>	<i>b</i>	<i>c</i>
1. $\begin{array}{r} 2299 \\ +3600 \\ \hline 5899 \end{array}$	$\begin{array}{r} 3216 \\ +2151 \\ \hline 5367 \end{array}$	$\begin{array}{r} 6334 \\ +2314 \\ \hline 8648 \end{array}$
2. $\begin{array}{r} 1762 \\ +3430 \\ \hline 5192 \end{array}$	$\begin{array}{r} 3299 \\ +1800 \\ \hline 5099 \end{array}$	$\begin{array}{r} 1679 \\ +3480 \\ \hline 5159 \end{array}$
3. $\begin{array}{r} 2489 \\ +1754 \\ \hline 4243 \end{array}$	$\begin{array}{r} 2578 \\ +1655 \\ \hline 4233 \end{array}$	$\begin{array}{r} 3577 \\ +4627 \\ \hline 8204 \end{array}$
4. $\begin{array}{r} 2468 \\ 1362 \\ +3516 \\ \hline 7346 \end{array}$	$\begin{array}{r} 3519 \\ 1521 \\ +3260 \\ \hline 8300 \end{array}$	$\begin{array}{r} 4287 \\ 3726 \\ +1032 \\ \hline 9045 \end{array}$

Subtracting Two-Digit Numbers from Three-Digit Numbers

You can subtract the ones and the tens and write the hundreds as part of the difference.

$$\begin{array}{r|l|l} \text{H} & \text{T} & \text{O} \\ 1 & 6 & 9 \\ - & 4 & 5 \\ \hline 1 & 2 & 4 \end{array}$$

Use with page 183.

	<i>a</i>	<i>b</i>	<i>c</i>	<i>d</i>
1.	346	785	143	520
	<u>-35</u>	<u>-33</u>	<u>-20</u>	<u>-10</u>
	311	752	123	510
2.	248	686	999	495
	<u>-42</u>	<u>-44</u>	<u>-64</u>	<u>-84</u>
	206	642	935	411

When there are fewer ones in the minuend than in the subtrahend, change the form of 1 ten in the minuend to 10 ones.

$$\begin{array}{r|l|l} \text{H} & \text{T} & \text{O} \\ 3 & 6 & 2 \\ - & 4 & 8 \\ \hline 3 & 1 & 4 \end{array}$$

Use with page 184.

	<i>a</i>	<i>b</i>	<i>c</i>	<i>d</i>
1.	988	350	695	850
	<u>-79</u>	<u>-35</u>	<u>-66</u>	<u>-24</u>
	909	315	629	826
2.	493	784	896	787
	<u>-56</u>	<u>-39</u>	<u>-48</u>	<u>-58</u>
	437	745	848	729
3.	297	473	721	382
	<u>-19</u>	<u>-48</u>	<u>-18</u>	<u>-24</u>
	278	425	703	358

You can change the form of hundreds in subtraction in the same way you change the form of tens.

$$\begin{array}{r|l|l} \text{H} & \text{T} & \text{O} \\ 3 & 13 & 5 \\ - & 6 & 2 \\ \hline 3 & 7 & 3 \end{array}$$

$$\begin{array}{r|l|l} \text{H} & \text{T} & \text{O} \\ 3 & 13 & 12 \\ - & 7 & 5 \\ \hline 3 & 6 & 7 \end{array}$$

Use with page 186.

	<i>a</i>	<i>b</i>	<i>c</i>	<i>d</i>
1.	219	348	536	865
	<u>-27</u>	<u>-50</u>	<u>-66</u>	<u>-72</u>
	192	298	470	793
2.	427	100	726	879
	<u>-95</u>	<u>-40</u>	<u>-84</u>	<u>-92</u>
	332	60	642	787
3.	679	438	728	555
	<u>-86</u>	<u>-54</u>	<u>-53</u>	<u>-65</u>
	593	384	675	490
4.	222	703	448	359
	<u>-71</u>	<u>-72</u>	<u>-62</u>	<u>-75</u>
	151	631	386	284

Use with pages 187 and 188.

	<i>a</i>	<i>b</i>	<i>c</i>	<i>d</i>
1.	100	503	202	604
	<u>-97</u>	<u>-54</u>	<u>-63</u>	<u>-77</u>
	3	449	139	527
2.	100	400	302	601
	<u>-89</u>	<u>-89</u>	<u>-96</u>	<u>-13</u>
	11	311	206	588
3.	500	501	103	304
	<u>-27</u>	<u>-99</u>	<u>-75</u>	<u>-65</u>
	473	402	28	239
4.	640	542	620	124
	<u>-56</u>	<u>-67</u>	<u>-74</u>	<u>-86</u>
	584	475	546	38

Subtracting from Three-Digit Numbers

You can subtract hundreds in the same way you subtract ones and tens.

$$\begin{array}{r|l} \text{H} & \text{T} & \text{O} \\ 3 & 4 & 5 \\ -2 & 1 & 3 \\ \hline 1 & 3 & 2 \end{array}$$

$$\begin{array}{r|l} \text{H} & \text{T} & \text{O} \\ 3 & 2 & 4 \\ -1 & 5 & 2 \\ \hline 1 & 7 & 2 \end{array}$$

$$\begin{array}{r|l} \text{H} & \text{T} & \text{O} \\ 3 & 0 & 7 \\ -1 & 1 & 9 \\ \hline 1 & 8 & 8 \end{array}$$

Use with page 199.

	<i>a</i>	<i>b</i>	<i>c</i>	<i>d</i>
1.	$\begin{array}{r} 468 \\ -235 \\ \hline 233 \end{array}$	$\begin{array}{r} 624 \\ -513 \\ \hline 111 \end{array}$	$\begin{array}{r} 785 \\ -344 \\ \hline 441 \end{array}$	$\begin{array}{r} 999 \\ -426 \\ \hline 573 \end{array}$
2.	$\begin{array}{r} 956 \\ -426 \\ \hline 530 \end{array}$	$\begin{array}{r} 386 \\ -164 \\ \hline 222 \end{array}$	$\begin{array}{r} 893 \\ -230 \\ \hline 663 \end{array}$	$\begin{array}{r} 979 \\ -221 \\ \hline 758 \end{array}$
3.	$\begin{array}{r} 707 \\ -105 \\ \hline 602 \end{array}$	$\begin{array}{r} 576 \\ -361 \\ \hline 215 \end{array}$	$\begin{array}{r} 785 \\ -481 \\ \hline 304 \end{array}$	$\begin{array}{r} 388 \\ -273 \\ \hline 115 \end{array}$

Use with page 200.

	<i>a</i>	<i>b</i>	<i>c</i>	<i>d</i>
1.	$\begin{array}{r} 548 \\ -364 \\ \hline 184 \end{array}$	$\begin{array}{r} 779 \\ -486 \\ \hline 293 \end{array}$	$\begin{array}{r} 246 \\ -155 \\ \hline 91 \end{array}$	$\begin{array}{r} 659 \\ -184 \\ \hline 475 \end{array}$
2.	$\begin{array}{r} 858 \\ -465 \\ \hline 393 \end{array}$	$\begin{array}{r} 826 \\ -472 \\ \hline 354 \end{array}$	$\begin{array}{r} 985 \\ -293 \\ \hline 692 \end{array}$	$\begin{array}{r} 816 \\ -676 \\ \hline 140 \end{array}$
3.	$\begin{array}{r} 436 \\ -351 \\ \hline 85 \end{array}$	$\begin{array}{r} 869 \\ -372 \\ \hline 497 \end{array}$	$\begin{array}{r} 637 \\ -462 \\ \hline 175 \end{array}$	$\begin{array}{r} 854 \\ -580 \\ \hline 274 \end{array}$
4.	$\begin{array}{r} 848 \\ -386 \\ \hline 462 \end{array}$	$\begin{array}{r} 241 \\ -180 \\ \hline 61 \end{array}$	$\begin{array}{r} 725 \\ -452 \\ \hline 273 \end{array}$	$\begin{array}{r} 307 \\ -173 \\ \hline 134 \end{array}$
5.	$\begin{array}{r} 468 \\ -394 \\ \hline 74 \end{array}$	$\begin{array}{r} 978 \\ -688 \\ \hline 290 \end{array}$	$\begin{array}{r} 634 \\ -243 \\ \hline 391 \end{array}$	$\begin{array}{r} 218 \\ -186 \\ \hline 32 \end{array}$

Use with page 202.

	<i>a</i>	<i>b</i>	<i>c</i>	<i>d</i>
1.	$\begin{array}{r} 340 \\ -156 \\ \hline 184 \end{array}$	$\begin{array}{r} 256 \\ -179 \\ \hline 77 \end{array}$	$\begin{array}{r} 684 \\ -396 \\ \hline 288 \end{array}$	$\begin{array}{r} 913 \\ -429 \\ \hline 484 \end{array}$
2.	$\begin{array}{r} 632 \\ -249 \\ \hline 383 \end{array}$	$\begin{array}{r} 944 \\ -588 \\ \hline 356 \end{array}$	$\begin{array}{r} 727 \\ -548 \\ \hline 179 \end{array}$	$\begin{array}{r} 922 \\ -325 \\ \hline 597 \end{array}$
3.	$\begin{array}{r} 565 \\ -276 \\ \hline 289 \end{array}$	$\begin{array}{r} 840 \\ -445 \\ \hline 395 \end{array}$	$\begin{array}{r} 672 \\ -594 \\ \hline 78 \end{array}$	$\begin{array}{r} 771 \\ -275 \\ \hline 496 \end{array}$
4.	$\begin{array}{r} 823 \\ -576 \\ \hline 247 \end{array}$	$\begin{array}{r} 324 \\ -145 \\ \hline 179 \end{array}$	$\begin{array}{r} 853 \\ -495 \\ \hline 358 \end{array}$	$\begin{array}{r} 922 \\ -663 \\ \hline 259 \end{array}$
5.	$\begin{array}{r} 714 \\ -385 \\ \hline 329 \end{array}$	$\begin{array}{r} 454 \\ -286 \\ \hline 168 \end{array}$	$\begin{array}{r} 960 \\ -497 \\ \hline 463 \end{array}$	$\begin{array}{r} 672 \\ -386 \\ \hline 286 \end{array}$
6.	$\begin{array}{r} 613 \\ -444 \\ \hline 169 \end{array}$	$\begin{array}{r} 862 \\ -388 \\ \hline 474 \end{array}$	$\begin{array}{r} 522 \\ -267 \\ \hline 255 \end{array}$	$\begin{array}{r} 450 \\ -375 \\ \hline 75 \end{array}$
7.	$\begin{array}{r} 824 \\ -589 \\ \hline 235 \end{array}$	$\begin{array}{r} 763 \\ -387 \\ \hline 376 \end{array}$	$\begin{array}{r} 835 \\ -666 \\ \hline 169 \end{array}$	$\begin{array}{r} 936 \\ -387 \\ \hline 549 \end{array}$
8.	$\begin{array}{r} 703 \\ -345 \\ \hline 358 \end{array}$	$\begin{array}{r} 901 \\ -787 \\ \hline 114 \end{array}$	$\begin{array}{r} 603 \\ -188 \\ \hline 415 \end{array}$	$\begin{array}{r} 904 \\ -525 \\ \hline 379 \end{array}$
9.	$\begin{array}{r} 903 \\ -675 \\ \hline 228 \end{array}$	$\begin{array}{r} 607 \\ -548 \\ \hline 59 \end{array}$	$\begin{array}{r} 306 \\ -119 \\ \hline 187 \end{array}$	$\begin{array}{r} 804 \\ -268 \\ \hline 536 \end{array}$
10.	$\begin{array}{r} 603 \\ -416 \\ \hline 187 \end{array}$	$\begin{array}{r} 208 \\ -159 \\ \hline 49 \end{array}$	$\begin{array}{r} 905 \\ -338 \\ \hline 567 \end{array}$	$\begin{array}{r} 702 \\ -657 \\ \hline 45 \end{array}$
11.	$\begin{array}{r} 503 \\ -479 \\ \hline 24 \end{array}$	$\begin{array}{r} 501 \\ -494 \\ \hline 7 \end{array}$	$\begin{array}{r} 805 \\ -569 \\ \hline 236 \end{array}$	$\begin{array}{r} 906 \\ -507 \\ \hline 399 \end{array}$
12.	$\begin{array}{r} 504 \\ -399 \\ \hline 105 \end{array}$	$\begin{array}{r} 901 \\ -238 \\ \hline 663 \end{array}$	$\begin{array}{r} 602 \\ -383 \\ \hline 219 \end{array}$	$\begin{array}{r} 607 \\ -269 \\ \hline 338 \end{array}$

Solving Problems Using Addition or Subtraction

Read each story problem. Pay special attention to the question. If sets are to be thought of as being put together, you are to add the numbers of the sets. If sets are to be taken apart, or if you are to find out by how many the number of one set differs from that of another, subtract the numbers of the sets.

Use with pages 204 and 205.

1. A farmer sold three calves. One weighed 208 lb., another 225 lb., and the third 217 lb. How much did all three calves weigh?

208+225+217=□ 650 lb.
2. One calf weighed 225 lb. A smaller calf weighed 208 lb. What was the difference in their weights? 225-208=□ 17 lb.

3. There are 127 boys and 196 girls in Boyan School. How many children are there in the school? 127+196=□ 323 children

4. One hot weekend, the ice cream store near the park sold 3476 ice cream cones. The next weekend they sold only 1583 cones. How many more cones did they sell the first weekend than the second? 3476-1583=□ 1893 cones

5. Peter was born in the year 1954. In what year will he be 49 years old? 1954+49=□ 2003

6. Paul's father bought him a fishing rod for \$11.46, a reel for \$5.98, fishing line for \$2.00, and hooks and sinkers for \$1.75. How much did he spend altogether? 11.46+5.98+2.00+1.75=□ \$21.19

7. Mary's mother bought a blue hat for \$5.25 and a green hat for \$3.59. How much more did the blue hat cost than the green hat? 5.25-3.59=□ \$1.66

8. There were 6087 books in the school library. The Mothers' Club bought 938 more books. Now how many books are in the library? 6087+938=□ 7025 books

9. The 4-H Club raised 683 chickens. They sold 488 chickens. How many chickens did they have left? 683-488=□ 195 chickens

10. In a domino game, Mary's score was 245. Jean's score was 180. How much higher was Mary's score than Jean's? 245-180=□ 65 points

11. Jim collects picture postcards. He has 1365 from places in the United States, 246 from South America, and 487 from Europe. How many postcards has he in his collection? 1365+246+487=□ 2098 postcards

12. A model kit costs \$8.75. It is on sale for \$6.99. How much can you save if you buy the kit on sale? 8.75-6.99=□ \$1.76

Subtracting from Four-Digit Numbers

You can subtract thousands as you subtract ones, tens, and hundreds.

Th	H	T	O
4	5	3	4
-3	2	1	1
1	3	2	3

Th	H	T	O
3	11	3	4
-2	3	2	1
1	8	1	3

Th	H	T	O
3	9	15	15
-1	7	7	8
2	2	8	7

Use with page 210.

	<i>a</i>	<i>b</i>	<i>c</i>
1.	4715 -896 <u>3819</u>	3826 -857 <u>2969</u>	8645 -779 <u>7866</u>
2.	9842 -998 <u>8844</u>	7842 -956 <u>6886</u>	5486 -687 <u>4799</u>
3.	6735 -849 <u>5886</u>	9854 -976 <u>8878</u>	8494 -496 <u>7998</u>
4.	7571 -895 <u>6676</u>	4163 -694 <u>3469</u>	8470 -782 <u>7688</u>
5.	4364 -685 <u>3679</u>	9256 -679 <u>8577</u>	3654 -886 <u>2768</u>
6.	6238 -1869 <u>4369</u>	4931 -2968 <u>1963</u>	8932 -2977 <u>5955</u>
7.	4516 -1618 <u>2898</u>	3582 -2596 <u>986</u>	9172 -5285 <u>3887</u>
8.	7064 -2895 <u>4169</u>	6503 -2746 <u>3757</u>	8004 -3529 <u>4475</u>
9.	6577 -3879 <u>2698</u>	5488 -1499 <u>3989</u>	8325 -7326 <u>999</u>
10.	6685 -2895 <u>3790</u>	5003 -1095 <u>3908</u>	4000 -3869 <u>131</u>
11.	8000 -6543 <u>1457</u>	9272 -5585 <u>3687</u>	6427 -3898 <u>2529</u>
12.	5400 -2601 <u>2799</u>	5364 -1685 <u>3679</u>	9157 -4679 <u>4478</u>

Use with page 206.

	<i>a</i>	<i>b</i>	<i>c</i>
1.	6469 -406 <u>6063</u>	6708 -604 <u>6104</u>	2384 -320 <u>2064</u>
2.	5689 -1443 <u>4246</u>	9676 -1325 <u>8351</u>	6783 -1452 <u>5331</u>
3.	5475 -2332 <u>3143</u>	9384 -2100 <u>7284</u>	8496 -6281 <u>2215</u>

Use with page 207.

	<i>a</i>	<i>b</i>	<i>c</i>
1.	6146 -931 <u>5215</u>	6284 -643 <u>5641</u>	4093 -971 <u>3122</u>
2.	4187 -824 <u>3363</u>	3543 -631 <u>2912</u>	5492 -752 <u>4740</u>
3.	8654 -913 <u>7741</u>	6082 -540 <u>5542</u>	7186 -826 <u>6360</u>
4.	7035 -213 <u>6822</u>	6379 -546 <u>5833</u>	4275 -825 <u>3450</u>
5.	6301 -587 <u>5714</u>	9136 -488 <u>8648</u>	4781 -987 <u>3794</u>

Multiplication Combinations Through Products of 45

A fast way to repeatedly add the same number is to multiply.

$$2+2+2=6$$

$$3 \times 2 = 6$$

Use with page 215.

$$\begin{array}{cc} a & b \\ 1. & 2+2+2+2=\boxed{8} \quad 4 \times 2 = \boxed{8} \end{array}$$

$$2. \quad 3+3+3=\boxed{9} \quad 3 \times 3 = \boxed{9}$$

One is the identity number of multiplication.

$$\begin{array}{cc} 1 \times 3 = 3 & 3 \times 1 = 3 \\ 1 \times 3 = 3 \times 1 \end{array}$$

Use with pages 218 and 219.

$$\begin{array}{ccccc} a & b & c & d & e \\ 1. & \begin{array}{r} 2 \\ \times 1 \\ \hline 2 \end{array} & \begin{array}{r} 1 \\ \times 7 \\ \hline 7 \end{array} & \begin{array}{r} 7 \\ \times 1 \\ \hline 7 \end{array} & \begin{array}{r} 1 \\ \times 2 \\ \hline 2 \end{array} & \begin{array}{r} 9 \\ \times 1 \\ \hline 9 \end{array} \\ 2. & \begin{array}{r} 6 \\ \times 1 \\ \hline 6 \end{array} & \begin{array}{r} 1 \\ \times 5 \\ \hline 5 \end{array} & \begin{array}{r} 1 \\ \times 6 \\ \hline 6 \end{array} & \begin{array}{r} 1 \\ \times 1 \\ \hline 1 \end{array} & \begin{array}{r} 5 \\ \times 1 \\ \hline 5 \end{array} \end{array}$$

Changing the order of the multiplier and the multiplicand does not change the product.

$$2 \times 3 = 6$$

$$3 \times 2 = 6$$

Use with page 228.

$$\begin{array}{cccc} 1. & \begin{array}{r} 9 \\ \times 3 \\ \hline 27 \end{array} & \begin{array}{r} 3 \\ \times 9 \\ \hline 27 \end{array} & \begin{array}{r} 8 \\ \times 4 \\ \hline 32 \end{array} & \begin{array}{r} 4 \\ \times 8 \\ \hline 32 \end{array} \\ 2. & \begin{array}{r} 1 \\ \times 8 \\ \hline 8 \end{array} & \begin{array}{r} 8 \\ \times 1 \\ \hline 8 \end{array} & \begin{array}{r} 1 \\ \times 4 \\ \hline 4 \end{array} & \begin{array}{r} 4 \\ \times 1 \\ \hline 4 \end{array} \end{array}$$

$$\begin{array}{cccc} a & b & c & d \\ 3. & \begin{array}{r} 8 \\ \times 2 \\ \hline 16 \end{array} & \begin{array}{r} 2 \\ \times 8 \\ \hline 16 \end{array} & \begin{array}{r} 6 \\ \times 3 \\ \hline 18 \end{array} & \begin{array}{r} 3 \\ \times 6 \\ \hline 18 \end{array} \\ 4. & \begin{array}{r} 6 \\ \times 2 \\ \hline 12 \end{array} & \begin{array}{r} 2 \\ \times 6 \\ \hline 12 \end{array} & \begin{array}{r} 9 \\ \times 4 \\ \hline 36 \end{array} & \begin{array}{r} 4 \\ \times 9 \\ \hline 36 \end{array} \\ 5. & \begin{array}{r} 5 \\ \times 2 \\ \hline 10 \end{array} & \begin{array}{r} 2 \\ \times 5 \\ \hline 10 \end{array} & \begin{array}{r} 5 \\ \times 4 \\ \hline 20 \end{array} & \begin{array}{r} 4 \\ \times 5 \\ \hline 20 \end{array} \\ 6. & \begin{array}{r} 7 \\ \times 3 \\ \hline 21 \end{array} & \begin{array}{r} 3 \\ \times 7 \\ \hline 21 \end{array} & \begin{array}{r} 4 \\ \times 2 \\ \hline 8 \end{array} & \begin{array}{r} 2 \\ \times 4 \\ \hline 8 \end{array} \\ 7. & \begin{array}{r} 7 \\ \times 4 \\ \hline 28 \end{array} & \begin{array}{r} 4 \\ \times 7 \\ \hline 28 \end{array} & \begin{array}{r} 5 \\ \times 3 \\ \hline 15 \end{array} & \begin{array}{r} 3 \\ \times 5 \\ \hline 15 \end{array} \\ 8. & \begin{array}{r} 7 \\ \times 2 \\ \hline 14 \end{array} & \begin{array}{r} 2 \\ \times 7 \\ \hline 14 \end{array} & \begin{array}{r} 8 \\ \times 3 \\ \hline 24 \end{array} & \begin{array}{r} 3 \\ \times 8 \\ \hline 24 \end{array} \\ 9. & \begin{array}{r} 9 \\ \times 2 \\ \hline 18 \end{array} & \begin{array}{r} 2 \\ \times 9 \\ \hline 18 \end{array} & \begin{array}{r} 6 \\ \times 4 \\ \hline 24 \end{array} & \begin{array}{r} 4 \\ \times 6 \\ \hline 24 \end{array} \\ 10. & \begin{array}{r} 3 \\ \times 2 \\ \hline 6 \end{array} & \begin{array}{r} 2 \\ \times 3 \\ \hline 6 \end{array} & \begin{array}{r} 3 \\ \times 4 \\ \hline 12 \end{array} & \begin{array}{r} 4 \\ \times 3 \\ \hline 12 \end{array} \end{array}$$

Use with page 231.

$$\begin{array}{cccc} a & b & c & d \\ 1. & \begin{array}{r} 6 \\ \times 5 \\ \hline 30 \end{array} & \begin{array}{r} 5 \\ \times 6 \\ \hline 30 \end{array} & \begin{array}{r} 7 \\ \times 5 \\ \hline 35 \end{array} & \begin{array}{r} 5 \\ \times 7 \\ \hline 35 \end{array} \\ 2. & \begin{array}{r} 8 \\ \times 5 \\ \hline 40 \end{array} & \begin{array}{r} 5 \\ \times 8 \\ \hline 40 \end{array} & \begin{array}{r} 9 \\ \times 5 \\ \hline 45 \end{array} & \begin{array}{r} 5 \\ \times 9 \\ \hline 45 \end{array} \\ 3. & \begin{array}{r} 3 \\ \times 3 \\ \hline 9 \end{array} & \begin{array}{r} 2 \\ \times 2 \\ \hline 4 \end{array} & \begin{array}{r} 4 \\ \times 4 \\ \hline 16 \end{array} & \begin{array}{r} 5 \\ \times 5 \\ \hline 25 \end{array} \end{array}$$

Division Combinations Through Dividends of 45

As a divisor, one is the identity number of division.

$$2 \div 1 = 2$$

Use with page 238.

- | | |
|-------------------------|-------------------------|
| 1. $4 \div 1 = \square$ | 5. $5 \div 1 = \square$ |
| 2. $8 \div 1 = \square$ | 3. $3 \div 1 = \square$ |
| 3. $7 \div 1 = \square$ | 9. $9 \div 1 = \square$ |
| 4. $6 \div 1 = \square$ | 1. $1 \div 1 = \square$ |

Division is the inverse operation of multiplication.

$7 \times 2 = 14$ $14 \div 2 = 7$
for: $2 \overline{)14}$ think: $7 \times 2 = 14$

Use with page 239.

- | | |
|---------------------------|---------------------------|
| 1. $4 \times 2 = \square$ | 8. $8 \div 2 = \square$ |
| 2. $2 \times 2 = \square$ | 4. $4 \div 2 = \square$ |
| 3. $6 \times 2 = \square$ | 12. $12 \div 2 = \square$ |
| 4. $8 \times 2 = \square$ | 16. $16 \div 2 = \square$ |
| 5. $5 \times 2 = \square$ | 10. $10 \div 2 = \square$ |
| 6. $9 \times 2 = \square$ | 18. $18 \div 2 = \square$ |
| 7. $1 \times 2 = \square$ | 2. $2 \div 2 = \square$ |
| 8. $3 \times 2 = \square$ | 6. $6 \div 2 = \square$ |

Use with pages 241 through 245.

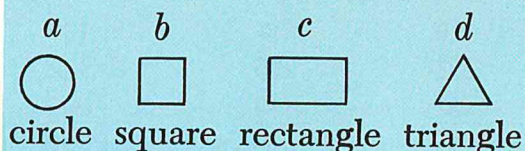
- | | | | |
|-----------------------|-----------------------|-----------------------|-----------------------|
| 1. $3 \overline{)3}$ | 4. $4 \overline{)28}$ | 3. $3 \overline{)12}$ | 4. $4 \overline{)36}$ |
| 2. $4 \overline{)8}$ | 3. $3 \overline{)21}$ | 5. $5 \overline{)45}$ | 3. $3 \overline{)15}$ |
| 3. $5 \overline{)25}$ | 4. $4 \overline{)12}$ | 3. $3 \overline{)18}$ | 4. $4 \overline{)20}$ |
| 4. $4 \overline{)32}$ | 3. $3 \overline{)6}$ | 5. $5 \overline{)35}$ | 3. $3 \overline{)24}$ |
| 5. $4 \overline{)16}$ | 5. $5 \overline{)45}$ | 3. $3 \overline{)9}$ | 5. $5 \overline{)15}$ |
| 6. $5 \overline{)10}$ | 4. $4 \overline{)28}$ | 5. $5 \overline{)30}$ | 5. $5 \overline{)40}$ |
| 7. $3 \overline{)27}$ | 5. $5 \overline{)20}$ | 5. $5 \overline{)5}$ | 4. $4 \overline{)24}$ |

Use with pages 248 through 250.

- | | |
|--------------------------|---------------------------|
| 1. $35 \div 7 = \square$ | 30. $30 \div 6 = \square$ |
| 2. $18 \div 9 = \square$ | 40. $40 \div 8 = \square$ |
| 3. $7 \div 7 = \square$ | 36. $36 \div 9 = \square$ |
| 4. $27 \div 9 = \square$ | 42. $42 \div 7 = \square$ |
| 5. $14 \div 7 = \square$ | 9. $9 \div 9 = \square$ |
| 6. $24 \div 6 = \square$ | 24. $24 \div 8 = \square$ |
| 7. $32 \div 8 = \square$ | 21. $21 \div 7 = \square$ |
| 8. $42 \div 6 = \square$ | 45. $45 \div 9 = \square$ |
| 9. $28 \div 7 = \square$ | 36. $36 \div 6 = \square$ |
| 10. $8 \div 8 = \square$ | 18. $18 \div 6 = \square$ |

Fractions and Remainders

Four common geometric shapes are the circle, the square, the rectangle, and the triangle.



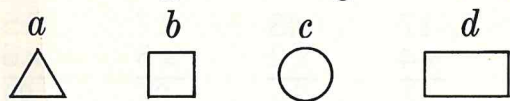
Use with pages 255 through 257.

1. Which of the shapes below are circles? *a, c*



2. Which of the shapes above are squares? *b*

3. Which of the shapes below are rectangles? Triangles? *b, d; a*



A fractional number can be named by using numerals and a fraction line.

one half $\frac{1}{2}$

Use with pages 258 through 261.

1. Write the fraction for each of these number words: one half, one sixth, two thirds, five eighths.

See below.

2. Write the number words for each of these fractions: $\frac{1}{6}$, $\frac{4}{5}$, $\frac{3}{4}$, $\frac{6}{10}$, $\frac{2}{3}$. *See below.*

1. $\frac{1}{2}$, $\frac{1}{6}$, $\frac{2}{3}$, $\frac{5}{8}$

2. One sixth; four fifths; three fourths; six tenths; two fifths

To find $\frac{1}{2}$, $\frac{1}{3}$, $\frac{1}{4}$, $\frac{1}{5}$, $\frac{1}{6}$, $\frac{1}{7}$, $\frac{1}{8}$, $\frac{1}{9}$, or $\frac{1}{10}$ of any number, divide that number by the number named below the line in the fraction.

$\frac{1}{2}$ of 4 = 2	$4 \div 2 = 2$
$\frac{1}{3}$ of 12 = 4	$12 \div 3 = 4$

Use with pages 262 and 263.

<i>a</i>	<i>b</i>
1. $\frac{1}{2}$ of 8 = <u>4</u>	$\frac{1}{2}$ of 16 = <u>8</u>
2. $\frac{1}{3}$ of 9 = <u>3</u>	$\frac{1}{3}$ of 27 = <u>9</u>

Use with pages 264 and 265.

<i>a</i>	<i>b</i>
1. $\frac{1}{4}$ of 20 = <u>5</u>	$\frac{1}{8}$ of 24 = <u>3</u>
2. $\frac{1}{5}$ of 30 = <u>6</u>	$\frac{1}{5}$ of 15 = <u>3</u>
3. $\frac{1}{6}$ of 18 = <u>3</u>	$\frac{1}{10}$ of 20 = <u>2</u>

When the amount left after the last division is less than the divisor, write it as a remainder.

$$\begin{array}{r} 5 \text{ r}1 \\ 2 \overline{)11} \\ \underline{-10} \\ 1 \end{array}$$

Use with pages 269 through 271.

<i>a</i>	<i>b</i>	<i>c</i>	<i>d</i>
1. $2 \overline{)5} \text{ } 2\text{r}1$	$3 \overline{)8} \text{ } 2\text{r}2$	$2 \overline{)9} \text{ } 4\text{r}1$	$2 \overline{)19} \text{ } 9\text{r}1$
2. $3 \overline{)10} \text{ } 3\text{r}1$	$3 \overline{)13} \text{ } 4\text{r}1$	$2 \overline{)15} \text{ } 7\text{r}1$	$3 \overline{)25} \text{ } 8\text{r}1$

Multiplying One-Digit Through Three-Digit Numbers

Each multiplication combination has a matching division combination.

$$8 \times 8 = 64$$

$$64 \div 8 = 8$$

Use with pages 275 and 276.

- | | <i>a</i> | <i>b</i> | <i>c</i> | <i>d</i> |
|----|---|--------------------|---|--------------------|
| 1. | $\begin{array}{r} 6 \\ \times 6 \\ \hline 36 \end{array}$ | $6 \overline{)36}$ | $\begin{array}{r} 7 \\ \times 7 \\ \hline 49 \end{array}$ | $7 \overline{)49}$ |
| 2. | $\begin{array}{r} 8 \\ \times 9 \\ \hline 72 \end{array}$ | $8 \overline{)72}$ | $\begin{array}{r} 9 \\ \times 8 \\ \hline 72 \end{array}$ | $9 \overline{)72}$ |
| 3. | $\begin{array}{r} 6 \\ \times 9 \\ \hline 54 \end{array}$ | $6 \overline{)54}$ | $\begin{array}{r} 9 \\ \times 6 \\ \hline 54 \end{array}$ | $9 \overline{)54}$ |
| 4. | $\begin{array}{r} 7 \\ \times 8 \\ \hline 56 \end{array}$ | $7 \overline{)56}$ | $\begin{array}{r} 8 \\ \times 7 \\ \hline 56 \end{array}$ | $8 \overline{)56}$ |
| 5. | $\begin{array}{r} 6 \\ \times 7 \\ \hline 42 \end{array}$ | $6 \overline{)42}$ | $\begin{array}{r} 7 \\ \times 6 \\ \hline 42 \end{array}$ | $7 \overline{)42}$ |
| 6. | $\begin{array}{r} 8 \\ \times 6 \\ \hline 48 \end{array}$ | $8 \overline{)48}$ | $\begin{array}{r} 6 \\ \times 8 \\ \hline 48 \end{array}$ | $6 \overline{)48}$ |

You can multiply tens in the same way you multiply ones.

$$2 \times 3 = 6$$

$$2 \times 30 = 60$$

Use with pages 277 and 278.

- | | <i>a</i> | <i>b</i> |
|----|------------------------|-------------------------|
| 1. | $4 \times 1 = \square$ | $4 \times 10 = \square$ |
| 2. | $3 \times 3 = \square$ | $3 \times 30 = \square$ |

Multiply the ones, the tens, and then the hundreds. Add the partial products.

$\begin{array}{r} \text{T} 0 \\ 32 \\ \times 3 \\ \hline 6 \\ 90 \\ \hline 96 \end{array}$	$\begin{array}{r} \text{T} 0 \\ 26 \\ \times 3 \\ \hline 18 \\ 60 \\ \hline 78 \end{array}$	$\begin{array}{r} \text{H} \text{T} 0 \\ 232 \\ \times 3 \\ \hline 6 \\ 90 \\ 600 \\ \hline 696 \end{array}$
--	---	--

Use with pages 279 through 281.

- | | <i>a</i> | <i>b</i> | <i>c</i> | <i>d</i> |
|----|--|--|--|--|
| 1. | $\begin{array}{r} 42 \\ \times 2 \\ \hline 84 \end{array}$ | $\begin{array}{r} 30 \\ \times 3 \\ \hline 90 \end{array}$ | $\begin{array}{r} 22 \\ \times 4 \\ \hline 88 \end{array}$ | $\begin{array}{r} 14 \\ \times 2 \\ \hline 28 \end{array}$ |
| 2. | $\begin{array}{r} 36 \\ \times 2 \\ \hline 72 \end{array}$ | $\begin{array}{r} 25 \\ \times 3 \\ \hline 75 \end{array}$ | $\begin{array}{r} 19 \\ \times 3 \\ \hline 57 \end{array}$ | $\begin{array}{r} 37 \\ \times 2 \\ \hline 74 \end{array}$ |
| 3. | $\begin{array}{r} 17 \\ \times 4 \\ \hline 68 \end{array}$ | $\begin{array}{r} 48 \\ \times 2 \\ \hline 96 \end{array}$ | $\begin{array}{r} 17 \\ \times 5 \\ \hline 85 \end{array}$ | $\begin{array}{r} 15 \\ \times 6 \\ \hline 90 \end{array}$ |

Use with pages 284 and 285.

- | | <i>a</i> | <i>b</i> | <i>c</i> | <i>d</i> |
|----|--|--|--|--|
| 1. | $\begin{array}{r} 1 \\ \times 4 \\ \hline 4 \end{array}$ | $\begin{array}{r} 100 \\ \times 4 \\ \hline 400 \end{array}$ | $\begin{array}{r} 3 \\ \times 3 \\ \hline 9 \end{array}$ | $\begin{array}{r} 100 \\ \times 3 \\ \hline 300 \end{array}$ |
| 2. | $\begin{array}{r} 243 \\ \times 2 \\ \hline 486 \end{array}$ | $\begin{array}{r} 312 \\ \times 3 \\ \hline 936 \end{array}$ | $\begin{array}{r} 111 \\ \times 9 \\ \hline 999 \end{array}$ | $\begin{array}{r} 432 \\ \times 2 \\ \hline 864 \end{array}$ |
| 3. | $\begin{array}{r} 224 \\ \times 2 \\ \hline 448 \end{array}$ | $\begin{array}{r} 123 \\ \times 3 \\ \hline 369 \end{array}$ | $\begin{array}{r} 443 \\ \times 2 \\ \hline 886 \end{array}$ | $\begin{array}{r} 212 \\ \times 4 \\ \hline 848 \end{array}$ |
| 4. | $\begin{array}{r} 342 \\ \times 2 \\ \hline 684 \end{array}$ | $\begin{array}{r} 321 \\ \times 3 \\ \hline 963 \end{array}$ | $\begin{array}{r} 404 \\ \times 2 \\ \hline 808 \end{array}$ | $\begin{array}{r} 143 \\ \times 2 \\ \hline 286 \end{array}$ |

Dividing One-Digit Through Three-Digit Numbers

You can divide tens in the same way you divide ones.

$$2 \div 2 = 1 \qquad 20 \div 2 = 10$$

Use with pages 287 and 288.

- | | |
|---|--|
| $\begin{array}{r} a \\ 1. \quad 8 \div 4 = \square \end{array}$ | $\begin{array}{r} b \\ 80 \div 4 = \square \end{array}$ |
| $\begin{array}{r} 2 \\ 2. \quad 6 \div 2 = \square \end{array}$ | $\begin{array}{r} 20 \\ 60 \div 2 = \square \end{array}$ |

Divide a two-digit number by dividing the tens and then the ones.

$\begin{array}{r} 3 \overline{)40} = 43 \\ 2 \overline{)86} \\ \underline{-80} \\ 6 \\ \underline{-6} \\ 0 \end{array}$	$\begin{array}{r} T \mid 0 \\ 3 \overline{)33} r1 \\ 2 \overline{)67} \\ \underline{-6} \\ 07 \\ \underline{-6} \\ 1 \end{array}$	$\begin{array}{r} T \mid 0 \\ 3 \overline{)42} \\ \underline{-3} \\ 12 \\ \underline{-12} \\ 0 \end{array}$
---	---	---

Use with pages 289 through 291.

- | | | | |
|--|---|---|---|
| $\begin{array}{r} a \\ 1. \quad 3 \overline{)90} \end{array}$ | $\begin{array}{r} b \\ 5 \overline{)50} \end{array}$ | $\begin{array}{r} c \\ 6 \overline{)60} \end{array}$ | $\begin{array}{r} d \\ 4 \overline{)80} \end{array}$ |
| $\begin{array}{r} 11 \\ 2. \quad 5 \overline{)55} \end{array}$ | $\begin{array}{r} 21 \\ 4 \overline{)84} \end{array}$ | $\begin{array}{r} 13 \\ 3 \overline{)39} \end{array}$ | $\begin{array}{r} 11 \\ 6 \overline{)66} \end{array}$ |

Use with pages 292 and 293.

- | | | | |
|--|---|---|---|
| $\begin{array}{r} a \\ 1. \quad 3 \overline{)35} \end{array}$ | $\begin{array}{r} b \\ 5 \overline{)57} \end{array}$ | $\begin{array}{r} c \\ 3 \overline{)68} \end{array}$ | $\begin{array}{r} d \\ 6 \overline{)69} \end{array}$ |
| $\begin{array}{r} 11r1 \\ 2. \quad 8 \overline{)89} \end{array}$ | $\begin{array}{r} 11r1 \\ 4 \overline{)45} \end{array}$ | $\begin{array}{r} 11r1 \\ 7 \overline{)78} \end{array}$ | $\begin{array}{r} 11r3 \\ 5 \overline{)58} \end{array}$ |
| $\begin{array}{r} 21r2 \\ 3. \quad 4 \overline{)86} \end{array}$ | $\begin{array}{r} 31r1 \\ 2 \overline{)63} \end{array}$ | $\begin{array}{r} 21r1 \\ 3 \overline{)64} \end{array}$ | $\begin{array}{r} 12r1 \\ 4 \overline{)49} \end{array}$ |

Use with page 294.

- | | | | |
|--|---|---|---|
| $\begin{array}{r} a \\ 1. \quad 3 \overline{)51} \end{array}$ | $\begin{array}{r} b \\ 6 \overline{)72} \end{array}$ | $\begin{array}{r} c \\ 4 \overline{)64} \end{array}$ | $\begin{array}{r} d \\ 5 \overline{)65} \end{array}$ |
| $\begin{array}{r} 15r3 \\ 2. \quad 5 \overline{)78} \end{array}$ | $\begin{array}{r} 16r1 \\ 4 \overline{)65} \end{array}$ | $\begin{array}{r} 11r4 \\ 6 \overline{)70} \end{array}$ | $\begin{array}{r} 18r1 \\ 3 \overline{)55} \end{array}$ |
| $\begin{array}{r} 14 \\ 3. \quad 4 \overline{)56} \end{array}$ | $\begin{array}{r} 28 \\ 3 \overline{)84} \end{array}$ | $\begin{array}{r} 29 \\ 2 \overline{)58} \end{array}$ | $\begin{array}{r} 23 \\ 4 \overline{)92} \end{array}$ |
| $\begin{array}{r} 26 \\ 4. \quad 2 \overline{)52} \end{array}$ | $\begin{array}{r} 16 \\ 4 \overline{)64} \end{array}$ | $\begin{array}{r} 18 \\ 4 \overline{)72} \end{array}$ | $\begin{array}{r} 25r2 \\ 3 \overline{)77} \end{array}$ |

You divide hundreds in the same way you divide ones and tens.

$$20 \div 2 = 10 \qquad 200 \div 2 = 100$$

$$\begin{array}{r} H \mid T \mid 0 \\ 4 \overline{)32} \\ 2 \overline{)86} 4 \\ \underline{-8} \quad \quad \\ 06 \\ \underline{-6} \quad \quad \\ 04 \\ \underline{-} \quad 4 \\ 0 \end{array}$$

Use with pages 295 and 296.

- | | | | |
|--|---|---|---|
| $\begin{array}{r} a \\ 1. \quad 4 \overline{)400} \end{array}$ | $\begin{array}{r} b \\ 3 \overline{)600} \end{array}$ | $\begin{array}{r} c \\ 8 \overline{)800} \end{array}$ | $\begin{array}{r} d \\ 2 \overline{)600} \end{array}$ |
| $\begin{array}{r} 143 \\ 2. \quad 2 \overline{)286} \end{array}$ | $\begin{array}{r} 121 \\ 4 \overline{)484} \end{array}$ | $\begin{array}{r} 123 \\ 3 \overline{)369} \end{array}$ | $\begin{array}{r} 324 \\ 2 \overline{)648} \end{array}$ |
| $\begin{array}{r} 211 \\ 3. \quad 4 \overline{)844} \end{array}$ | $\begin{array}{r} 223 \\ 3 \overline{)669} \end{array}$ | $\begin{array}{r} 341 \\ 2 \overline{)682} \end{array}$ | $\begin{array}{r} 232 \\ 3 \overline{)696} \end{array}$ |
| $\begin{array}{r} 112 \\ 4. \quad 4 \overline{)448} \end{array}$ | $\begin{array}{r} 224 \\ 2 \overline{)448} \end{array}$ | $\begin{array}{r} 413 \\ 2 \overline{)826} \end{array}$ | $\begin{array}{r} 142 \\ 2 \overline{)284} \end{array}$ |
| $\begin{array}{r} 231 \\ 5. \quad 2 \overline{)462} \end{array}$ | $\begin{array}{r} 341 \\ 2 \overline{)682} \end{array}$ | $\begin{array}{r} 212 \\ 4 \overline{)848} \end{array}$ | $\begin{array}{r} 311 \\ 3 \overline{)933} \end{array}$ |

Solving Problems Using Multiplication or Division

Read each problem carefully. If you are to find how many in all of the groups of equal size, multiply the numbers. If you are to find how many groups of equal size, or how many in each group, divide the numbers.

Use with page 298.

1. It is 156 miles from Ames City to Springtown and back. How many miles would you travel if you made 3 trips from Ames City to Springtown and back? $3 \times 156 = \square$ 468 miles

2. 488 pupils from Mann School helped on Clean-up Day. If there were 4 pupils on a squad, how many squads were there to help? $488 \div 4 = \square$ 122 squads

3. Marvin is 9 years old. His father is 4 times his age. How old is Marvin's father? $4 \times 9 = \square$ 36 years old

4. 6 boys helped the teacher carry books to the storeroom. If each boy carried 96 books, how many books did they all carry? $6 \times 96 = \square$ 576 books

5. There are 369 policemen in Belleville. $\frac{1}{3}$ of them work from 7:00 to 3:00. How many policemen work from 7:00 to 3:00? $369 \div 3 = \square$ 123 policemen

6. The Ace Dairy delivered 488 ice cream bars to the school to be given to the first, second, third, and fourth grades. If each grade received the same number of bars, how many bars did each grade receive? $488 \div 4 = \square$ 122 bars

7. There were 64 words on the spelling test. Martha folded her paper into 4 columns. If each column is to have the same number of words, how many words should Martha write in each column? $64 \div 4 = \square$ 16 words

8. The milkman delivered 60 quarts of milk to the Johnson house in the month of May. If he delivered 4 quarts each trip, how many deliveries did he make in May? $60 \div 4 = \square$ 15 deliveries

9. At the vegetable stand, Jane bought 5 bunches of carrots. Each bunch had 12 carrots. How many carrots did Jane buy? $5 \times 12 = \square$ 60 carrots

10. Millie has 96 crayons. If she wishes to put them into boxes with 8 crayons each, how many crayon boxes will she need? $96 \div 8 = \square$ 12 crayon boxes

11. Mrs. Brown bought 6 boxes of Girl Scout cookies. If there were 36 cookies in a box, how many cookies did she buy? $6 \times 36 = \square$ 216 cookies

Diagnostic Self-Tests

The tests on pages 321 to 324 of your book will help you and your teacher to see how much you have learned in arithmetic. Do each test carefully and check your work before you give your paper to your teacher.

Self-Test 1—Number Meanings

Write the numeral that stands for the number of each set below.

- | <i>a</i> | <i>b</i> |
|---|---|
| 1. $\begin{array}{c} \text{xx} \\ \text{xxx} \end{array}$ 5 | $\begin{array}{c} \text{ } \\ \text{ } \end{array}$ 0 |
| 2. $\begin{array}{c} \text{xxxx} \\ \text{xxxxx} \end{array}$ 7 | $\begin{array}{c} \text{xxxxxx} \\ \text{xxxxxxx} \end{array}$ 11 |

Write the numeral that belongs in each below.

3. 0, 1, 2, 3, 4, 5, 6.

Replace each with a word.

4. Saturday is the 7th day of the week.

5. The fourth letter of the alphabet is d.

Write a numeral to answer each of these questions.

6. Which numeral means 9 tens and 0 ones? 90

7. Which numeral, 9, 7, or 6, in 976 means hundreds? 9

8. Which numeral, 4, 9, 7, or 5 in 4975 means thousands? 4

Self-Test 2—Addition

Copy. Replace each \square with a numeral.

- | <i>a</i> | <i>b</i> |
|-----------------------|--------------------|
| 1. $6 + 4 = \square$ | $6 + \square = 10$ |
| 2. $9 + 6 = \square$ | $\square + 9 = 15$ |
| 3. $4 + 7 = \square$ | $4 + \square = 11$ |
| 4. $15 + 4 = \square$ | $11 + 6 = \square$ |
| 5. $17 + 8 = \square$ | $36 + 9 = \square$ |

Copy. Write each sum.

- | | <i>a</i> | <i>b</i> | <i>c</i> |
|-----|---|---|---|
| 6. | $\begin{array}{r} 17 \\ +12 \\ \hline 29 \end{array}$ | $\begin{array}{r} 25 \\ +13 \\ \hline 38 \end{array}$ | $\begin{array}{r} 16 \\ +17 \\ \hline 33 \end{array}$ |
| 7. | $\begin{array}{r} 38 \\ +26 \\ \hline 64 \end{array}$ | $\begin{array}{r} 123 \\ +145 \\ \hline 268 \end{array}$ | $\begin{array}{r} 628 \\ +130 \\ \hline 758 \end{array}$ |
| 8. | $\begin{array}{r} 168 \\ +247 \\ \hline 415 \end{array}$ | $\begin{array}{r} 596 \\ +139 \\ \hline 735 \end{array}$ | $\begin{array}{r} 458 \\ +943 \\ \hline 1401 \end{array}$ |
| 9. | $\begin{array}{r} 4826 \\ +1044 \\ \hline 5870 \end{array}$ | $\begin{array}{r} 5968 \\ +1355 \\ \hline 7323 \end{array}$ | $\begin{array}{r} 2187 \\ +4088 \\ \hline 6275 \end{array}$ |
| 10. | $\begin{array}{r} 2168 \\ 3488 \\ +2194 \\ \hline 7850 \end{array}$ | $\begin{array}{r} 3599 \\ 1206 \\ +3905 \\ \hline 8710 \end{array}$ | $\begin{array}{r} 1608 \\ 2493 \\ +4088 \\ \hline 8189 \end{array}$ |
| | | | 321 |

Self-Test 3—Subtraction

Copy. Write each difference.

	<i>a</i>	<i>b</i>	<i>c</i>	<i>d</i>	<i>e</i>
1.	$\begin{array}{r} 9 \\ -4 \\ \hline 5 \end{array}$	$\begin{array}{r} 6 \\ -3 \\ \hline 3 \end{array}$	$\begin{array}{r} 8 \\ -4 \\ \hline 4 \end{array}$	$\begin{array}{r} 5 \\ -2 \\ \hline 3 \end{array}$	$\begin{array}{r} 7 \\ -6 \\ \hline 1 \end{array}$
2.	$\begin{array}{r} 6 \\ -6 \\ \hline 0 \end{array}$	$\begin{array}{r} 9 \\ -6 \\ \hline 3 \end{array}$	$\begin{array}{r} 8 \\ -5 \\ \hline 3 \end{array}$	$\begin{array}{r} 4 \\ -3 \\ \hline 1 \end{array}$	$\begin{array}{r} 7 \\ -4 \\ \hline 3 \end{array}$
3.	$\begin{array}{r} 15 \\ -9 \\ \hline 6 \end{array}$	$\begin{array}{r} 15 \\ -6 \\ \hline 9 \end{array}$	$\begin{array}{r} 12 \\ -4 \\ \hline 8 \end{array}$	$\begin{array}{r} 17 \\ -8 \\ \hline 9 \end{array}$	$\begin{array}{r} 12 \\ -3 \\ \hline 9 \end{array}$
4.	$\begin{array}{r} 14 \\ -6 \\ \hline 8 \end{array}$	$\begin{array}{r} 28 \\ -5 \\ \hline 23 \end{array}$	$\begin{array}{r} 37 \\ -3 \\ \hline 34 \end{array}$	$\begin{array}{r} 51 \\ -6 \\ \hline 45 \end{array}$	$\begin{array}{r} 83 \\ -9 \\ \hline 74 \end{array}$
5.	$\begin{array}{r} 76 \\ -9 \\ \hline 67 \end{array}$	$\begin{array}{r} 91 \\ -6 \\ \hline 85 \end{array}$	$\begin{array}{r} 83 \\ -8 \\ \hline 75 \end{array}$	$\begin{array}{r} 96 \\ -7 \\ \hline 89 \end{array}$	$\begin{array}{r} 58 \\ -9 \\ \hline 49 \end{array}$
6.	$\begin{array}{r} 87 \\ -9 \\ \hline 78 \end{array}$	$\begin{array}{r} 46 \\ -7 \\ \hline 39 \end{array}$	$\begin{array}{r} 72 \\ -8 \\ \hline 64 \end{array}$	$\begin{array}{r} 93 \\ -6 \\ \hline 87 \end{array}$	$\begin{array}{r} 25 \\ -8 \\ \hline 17 \end{array}$

Copy. Write each difference.

	<i>a</i>	<i>b</i>	<i>c</i>	<i>d</i>
7.	$\begin{array}{r} 96 \\ -15 \\ \hline 81 \end{array}$	$\begin{array}{r} 187 \\ -35 \\ \hline 152 \end{array}$	$\begin{array}{r} 693 \\ -46 \\ \hline 647 \end{array}$	$\begin{array}{r} 625 \\ -82 \\ \hline 543 \end{array}$
8.	$\begin{array}{r} 239 \\ -75 \\ \hline 164 \end{array}$	$\begin{array}{r} 306 \\ -94 \\ \hline 212 \end{array}$	$\begin{array}{r} 241 \\ -75 \\ \hline 166 \end{array}$	$\begin{array}{r} 500 \\ -37 \\ \hline 463 \end{array}$
9.	$\begin{array}{r} 246 \\ -213 \\ \hline 33 \end{array}$	$\begin{array}{r} 156 \\ -142 \\ \hline 14 \end{array}$	$\begin{array}{r} 816 \\ -241 \\ \hline 575 \end{array}$	$\begin{array}{r} 654 \\ -193 \\ \hline 461 \end{array}$
10.	$\begin{array}{r} 604 \\ -139 \\ \hline 465 \end{array}$	$\begin{array}{r} 527 \\ -258 \\ \hline 269 \end{array}$	$\begin{array}{r} 4534 \\ -3211 \\ \hline 1323 \end{array}$	$\begin{array}{r} 7368 \\ -4037 \\ \hline 3331 \end{array}$
11.	$\begin{array}{r} 5144 \\ -321 \\ \hline 4823 \end{array}$	$\begin{array}{r} 7286 \\ -3542 \\ \hline 3744 \end{array}$	$\begin{array}{r} 5075 \\ -1788 \\ \hline 3287 \end{array}$	$\begin{array}{r} 3208 \\ -1659 \\ \hline 1549 \end{array}$

Self-Test 4—Multiplication

Copy. Replace each \square with a numeral.

	<i>a</i>	<i>b</i>	<i>c</i>
1.	$5 \times 5 = \square$	$6 \times 6 = \square$	$4 \times 9 = \square$
2.	$9 \times 3 = \square$	$6 \times 2 = \square$	$9 \times 2 = \square$
3.	$5 \times 2 = \square$	$1 \times 8 = \square$	$6 \times 3 = \square$
4.	$8 \times 1 = \square$	$3 \times 6 = \square$	$9 \times 4 = \square$
5.	$6 \times 4 = \square$	$4 \times 6 = \square$	$3 \times 8 = \square$
6.	$7 \times 3 = \square$	$5 \times 7 = \square$	$9 \times 5 = \square$
7.	$6 \times 5 = \square$	$7 \times 5 = \square$	$4 \times 5 = \square$
8.	$9 \times 1 = \square$	$6 \times 7 = \square$	$8 \times 5 = \square$
9.	$4 \times 8 = \square$	$8 \times 3 = \square$	$5 \times 4 = \square$
10.	$8 \times 4 = \square$	$5 \times 6 = \square$	$4 \times 7 = \square$

Copy. Write each product.

	<i>a</i>	<i>b</i>	<i>c</i>	<i>d</i>
11.	$\begin{array}{r} 63 \\ \times 3 \\ \hline 189 \end{array}$	$\begin{array}{r} 40 \\ \times 5 \\ \hline 200 \end{array}$	$\begin{array}{r} 72 \\ \times 3 \\ \hline 216 \end{array}$	$\begin{array}{r} 51 \\ \times 7 \\ \hline 357 \end{array}$
12.	$\begin{array}{r} 48 \\ \times 2 \\ \hline 96 \end{array}$	$\begin{array}{r} 17 \\ \times 5 \\ \hline 85 \end{array}$	$\begin{array}{r} 15 \\ \times 6 \\ \hline 90 \end{array}$	$\begin{array}{r} 18 \\ \times 4 \\ \hline 72 \end{array}$
13.	$\begin{array}{r} 204 \\ \times 2 \\ \hline 408 \end{array}$	$\begin{array}{r} 123 \\ \times 3 \\ \hline 369 \end{array}$	$\begin{array}{r} 443 \\ \times 2 \\ \hline 886 \end{array}$	$\begin{array}{r} 212 \\ \times 4 \\ \hline 848 \end{array}$
14.	$\begin{array}{r} 237 \\ \times 2 \\ \hline 474 \end{array}$	$\begin{array}{r} 308 \\ \times 3 \\ \hline 924 \end{array}$	$\begin{array}{r} 256 \\ \times 2 \\ \hline 512 \end{array}$	$\begin{array}{r} 144 \\ \times 3 \\ \hline 432 \end{array}$
15.	$\begin{array}{r} 241 \\ \times 2 \\ \hline 482 \end{array}$	$\begin{array}{r} 382 \\ \times 2 \\ \hline 764 \end{array}$	$\begin{array}{r} 261 \\ \times 3 \\ \hline 783 \end{array}$	$\begin{array}{r} 322 \\ \times 3 \\ \hline 966 \end{array}$

Self-Test 5—Division

Copy. Write each quotient.

<i>a</i>	<i>b</i>	<i>c</i>
1. $6 \div 3 = \square$	$9 \div 3 = \square$	$8 \div 2 = \square$
2. $6 \div 2 = \square$	$4 \div 2 = \square$	$8 \div 4 = \square$
3. $2 \div 2 = \square$	$6 \div 6 = \square$	$8 \div 8 = \square$
4. $7 \div 1 = \square$	$1 \div 1 = \square$	$5 \div 1 = \square$

Copy. Replace each \square with the correct numeral.

<i>a</i>	<i>b</i>
5. $45 \div \square = 9$	$36 \div \square = 4$
6. $24 \div 8 = \square$	$\square \div 8 = 4$
7. $\square \div 7 = 4$	$27 \div \square = 3$
8. $\square \div 6 = 5$	$\square \div 8 = 3$
9. $\square \div 4 = 4$	$18 \div 6 = \square$

Copy. Write each quotient.

<i>a</i>	<i>b</i>	<i>c</i>	<i>d</i>
10. $8 \overline{)32}$	$7 \overline{)28}$	$6 \overline{)12}$	$9 \overline{)36}$
11. $9 \overline{)45}$	$9 \overline{)27}$	$6 \overline{)24}$	$7 \overline{)21}$
12. $4 \overline{)7}$	$5 \overline{)9}$	$2 \overline{)7}$	$5 \overline{)7}$
13. $3 \overline{)69}$	$4 \overline{)84}$	$2 \overline{)84}$	$3 \overline{)36}$
14. $5 \overline{)56}$	$4 \overline{)86}$	$3 \overline{)75}$	$4 \overline{)92}$
15. $2 \overline{)648}$	$2 \overline{)639}$	$4 \overline{)848}$	$2 \overline{)424}$
16. $2 \overline{)624}$	$2 \overline{)248}$	$3 \overline{)699}$	$3 \overline{)393}$

Self-Test 6—Fractions

Write the fraction for each number word below.

<i>a</i>	<i>b</i>
1. one half	two thirds
2. one fourth	five sixths

Copy. Replace each \square with a numeral.

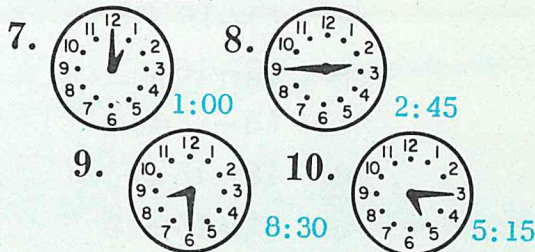
<i>a</i>	<i>b</i>
3. $\frac{1}{3}$ of 12 = \square	$\frac{1}{4}$ of 8 = \square
4. $\frac{1}{2}$ of 10 = \square	$\frac{1}{4}$ of 16 = \square
5. $\frac{1}{3}$ of 15 = \square	$\frac{1}{2}$ of 24 = \square

Self-Test 7—Measurements

Copy. Replace each \square with a numeral.

- 8 quarts = \square gallons.
- 6 feet = \square yards.
- 2 pounds = \square ounces.
- 4 pints = \square quarts.
- 16 cups = \square quarts.
- 6 yards = \square feet.

Write the time shown on each of these clocks.



Self-Test 8—Problem Solving

Choose the correct arithmetic statement that follows each problem and solve the problem.

1. 18 boys and 9 girls were on a school bus. How many children were on the bus?

- a. $18 \div 9 = \square$
- b. $9 + \square = 18$
- c. $18 + 9 = \square$ 27
- d. $9 + 18 = \square$
- e. $\square - 9 = 9$

2. Bob has 48 pictures. His album will hold 4 more. How many pictures will his album hold?

- a. $48 \div 4 = \square$
- b. $\square + 4 = 48$
- c. $48 - 4 = \square$
- d. $48 + 4 = \square$ 52
- e. $4 \times 48 = \square$

3. 16 boys and 18 girls were in the third grade. How many children were in the third grade?

- a. $\square - 16 = 18$
- b. $18 - 16 = \square$
- c. $18 - \square = 16$
- d. $18 + 16 = \square$ 34
- e. $\square + 16 = 18$

Solve each problem.

4. Sam is 48 inches tall. His father is 67 inches tall. How much shorter is Sam than his father? $67 - 48 = \square$ 19 inches

5. Paul had 12 chocolate candy bars. He gave the same number of candy bars to each of 3 of his friends. How many candy bars did each friend receive?

$12 \div 3 = \square$ 4 candy bars

6. 35 children went on a trip to visit the museum. If 5 children rode in each car, how many cars did they need? $35 \div 5 = \square$ 7 cars

7. Sharon's mother bought a green dress for \$36.95, a brown hat for \$8.59, shoes for \$17.23, and a raincoat for \$21.47. How much did she spend altogether?

$36.95 + 8.59 + 17.23 + 21.47 = \square$ \$84.24

8. The first birthday of the United States was July 4, 1776. How old will the United States be on July 4, 1976? $1976 - 1776 = \square$ 200 years old

9. In 1950 there were 2486 people living in Mayville. In 1960 there were 5230 people living there. How many more people were living in Mayville in 1960 than in 1950? $5230 - 2486 = \square$ 2744 people

10. 234 children went on the Brady School picnic in June. The Mothers' Club made 3 sandwiches for each child. How many sandwiches did they make?

$234 \times 3 = \square$ 702 sandwiches

HANDBOOK

Many of your questions about arithmetic can be answered by using this handbook. Form the habit of turning to it when you need to review an idea you have studied.

The handbook is easy to use. Its seven sections are arranged in alphabetical order. Each section is divided into parts. The numerals in () tell the pages in the book that give more information on a topic.

Addition

The Main Ideas

1. Meaning When you think of two sets as being put together, you may add their numbers. (17, 18)

1 X and 5 X's are 6 X's.
 $1 + 5 = 6$

2. Words and signs An addition statement is written in the language of arithmetic, using numerals and signs. (18)

2	+	3	=	5
↑	↑	↑	↑	↑
addend	plus sign	addend	equal sign	sum

3. Zero is an identity number When zero is added to any number, or any number is added to zero, the sum is that number. (27)

$$\begin{array}{l} 5 + 0 = 5 \\ 6 + 0 = 6 \end{array}$$

$$\begin{array}{l} 0 + 5 = 5 \\ 0 + 6 = 6 \end{array}$$

4. Commutative property The order in which you combine the addends in an addition makes no difference in the sum. (28)

$$\begin{array}{l} 4 + 3 = 7 \\ 3 + 4 = 7 \\ 4 + 3 = 3 + 4 \end{array}$$

5. Checking Check by changing the order and grouping of the numbers being added. (28)

add down	$\begin{array}{r} 3 \\ 9 \\ + 7 \\ \hline 19 \end{array}$	add up	$\begin{array}{r} 3 \\ 9 \\ + 7 \\ \hline 19 \end{array}$
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6. Associative property When adding three or more numbers, any two addends may be grouped in any way without changing the sum. (86)

$$\begin{array}{l} 3 + 2 + 5 = (3 + 2) + 5 = 5 + 5 = 10 \\ 3 + 2 + 5 = 3 + (2 + 5) = 3 + 7 = 10 \end{array}$$

How to Add

1. Adding two numbers The examples below show you the steps you take in adding two numbers.

a.
$$\begin{array}{r} 8 \\ +6 \\ \hline 14 \end{array}$$
 Add the ones. Change the form of 10 ones to 1 ten. (50, 144, 164)

b.
$$\begin{array}{r} 24 \\ +3 \\ \hline 27 \end{array}$$
 Add the ones and write the tens. (77)

c.
$$\begin{array}{r} 8 \\ +37 \\ \hline 45 \end{array}$$
 Add the ones. Change the form of 10 ones to 1 ten. Add the tens. (82)

d.
$$\begin{array}{r} 42 \\ +34 \\ \hline 76 \end{array}$$
 Add the ones. Add the tens. (93)

e.
$$\begin{array}{r} 8 \\ +94 \\ \hline 102 \end{array}$$
 Add the ones. Change the form of 10 ones to 1 ten. Add the tens. Change the form of 10 tens to 1 hundred. (143, 144)

f.
$$\begin{array}{r} 37 \\ +24 \\ \hline 61 \end{array}$$
 Add the ones. Change the form of 10 ones to 1 ten. Add the tens. (96)

g.
$$\begin{array}{r} 86 \\ +47 \\ \hline 133 \end{array}$$
 Add the ones. Change the form of 10 ones to 1 ten. Add the tens. Change the form of 10 tens to 1 hundred. (153)

2. Adding three- and four-digit numbers You can add hundreds and thousands in the same way you add ones and tens. (163-167, 174-178)

$$\begin{array}{r} 327 \\ 248 \\ +932 \\ \hline 1507 \end{array}$$

$$\begin{array}{r} 2163 \\ 4183 \\ +1968 \\ \hline 8314 \end{array}$$

3. Adding three or more numbers You add three or more numbers in the same way you add two numbers. When you add three or more numbers, you can add only two numbers at one time. (24, 86)

$$\begin{array}{r} 4 \\ 6 \\ +3 \\ \hline 13 \end{array} \quad \begin{array}{r} 4 \\ +6 \\ \hline 10 \end{array} \longrightarrow \begin{array}{r} 10 \\ +3 \\ \hline 13 \end{array}$$

Division

The Main Ideas

1. Meaning When you separate one group into smaller groups of equal size, or when you find how many in each group of equal size, you are dividing. (235, 236, 242, 243)

a. When 6 is divided into groups of 2 the quotient is 3.

$$6 \div 2 = 3$$

b. When 6 is divided into 2 groups of equal size, there are 3 in each group.

$$6 \div 2 = 3$$

2. Words and signs A division statement contains numerals and signs. (235, 236)

$$\begin{array}{ccccccc}
 6 & \div & 2 & = & 3 \\
 \uparrow & \uparrow & \uparrow & \uparrow & \uparrow \\
 \text{dividend} & \text{division sign} & \text{divisor} & \text{equal sign} & \text{quotient}
 \end{array}$$

$$\begin{array}{r}
 3 \text{ quotient} \\
 \text{divisor } 2 \overline{) 6} \text{ dividend}
 \end{array}$$

3. A divisor of 1 When you divide a number by 1, the quotient is that number. (238)

$$4 \div 1 = 4$$

$$6 \div 1 = 6$$

4. Checking Multiplication and division are inverse operations. (249)

divide: $35 \div 5 = 7$ check: $7 \times 5 = 35$

5. Remainders The number left after the final subtraction is called the remainder. (270)

$$\begin{array}{r}
 5 \text{ r}1 \\
 2 \overline{) 11} \\
 \underline{-10} \\
 1 \text{ remainder}
 \end{array}$$

How to Divide

1. Dividing one-digit numbers The examples below show the steps.

a. $\begin{array}{r} 3 \\ 2 \overline{) 6} \\ \underline{-6} \\ 0 \end{array}$ Divide the ones.
Multiply.
Subtract. (236-237)

b. $\begin{array}{r} 2 \text{ r}1 \\ 3 \overline{) 7} \\ \underline{-6} \\ 1 \end{array}$ Divide the ones.
Multiply.
Subtract. Write the remainder. (269)

2. Dividing two-digit numbers: basic combinations The example shows the steps to take in dividing two-digit numbers.

$$\begin{array}{r}
 7 \\
 4 \overline{) 28} \\
 \underline{-28} \\
 0
 \end{array}$$

Think: How many 4's are contained in 28?
Multiply.
Subtract. (239-245, 247-250)

3. Dividing two-digit numbers: tens and ones The examples below show you the steps to take.

a. $\begin{array}{r} 21 \\ 4 \overline{) 84} \\ \underline{-8} \\ 04 \\ \underline{-4} \\ 0 \end{array}$ Divide the tens.
Multiply.
Subtract.
Divide the ones.
Multiply.
Subtract. (290)

b. $\begin{array}{r} 10 \\ 3 \overline{) 42} \\ \underline{-3} \\ 12 \\ \underline{-1} \\ 10 \end{array}$ Divide the tens.
Multiply.
Subtract. Change the form of the tens to ones.
Divide the ones.
Multiply.
Subtract. (294)

4. Dividing three-digit numbers Three-digit numbers are divided in the same way as two-digit numbers.

$$\begin{array}{r}
 432 \\
 2 \overline{) 864} \\
 \underline{-8} \\
 06 \\
 \underline{-6} \\
 04 \\
 \underline{-4} \\
 0
 \end{array}$$

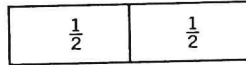
Divide the hundreds.
Multiply.
Subtract.
Divide the tens.
Multiply.
Subtract.
Divide the ones.
Multiply.
Subtract. (295)

Fractions

The Main Ideas

1. Meaning You use a fraction to name part of one object or to name part of a group of objects. (258, 259)

one half of a rectangle



one half of a group of 6



2. Words and signs A fraction is written by using two numerals, one above the other. The numerals are separated by a short line. (258)

$\frac{1}{2}$ one half

$\frac{2}{3}$ two thirds

How to Use Fractions

1. Finding $\frac{1}{2}$ of a number To find $\frac{1}{2}$ of a number, divide the number by 2. (262)

$$\frac{1}{2} \text{ of } 8 \text{ becomes } 8 \div 2 = 4$$

2. Finding $\frac{1}{3}$ of a number To find $\frac{1}{3}$ of a number, divide the number by 3. (263)

$$\frac{1}{3} \text{ of } 6 \text{ becomes } 6 \div 3 = 2$$

3. Finding $\frac{1}{4}$ of a number To find $\frac{1}{4}$ of a number, divide the number by 4. (264)

$$\frac{1}{4} \text{ of } 8 \text{ becomes } 8 \div 4 = 2$$

$$\frac{1}{4} \text{ of } 12 \text{ becomes } 12 \div 4 = 3$$

Multiplication

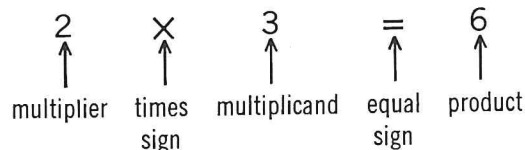
The Main Ideas

1. Meaning You use multiplication to find how many in all of the groups of equal size. (213, 214, 215)

$$2 + 2 + 2 = 6$$

$$3 \times 2 = 6$$

2. Words and signs A multiplication statement is written using numerals and signs. (217)



3. Commutative property Changing the order of the numbers being multiplied does not change the product. (218)

$$3 \times 2 = 6 \text{ and } 2 \times 3 = 6$$

4. One is an identity number Multiplying a number by 1 or multiplying 1 by any number, does not change the number. (218)

$$3 \times 1 = 3 \text{ and } 1 \times 3 = 3$$

5. Checking Check multiplication by using addition. (225, 278)

$$3 \times 5 = 15$$

$$5 + 5 + 5 = 15$$

6. Multiplying 10 To multiply 10 by a number, name the number and place a zero after the numeral. (277)

$$1 \times 10 = 10$$

$$2 \times 10 = 20$$

$$3 \times 10 = 30$$

$$4 \times 10 = 40$$

How to Multiply

1. Multiplying one-digit numbers

The examples below show you how to multiply one-digit numbers.

a.
$$\begin{array}{r} 3 \\ \times 2 \\ \hline 6 \end{array}$$
 Multiply the ones. (215)

b.
$$\begin{array}{r} 3 \\ \times 5 \\ \hline 15 \end{array}$$
 Multiply the ones. Change the form of 10 ones to 1 ten. (214-218)

2. Multiplying two-digit numbers

The examples below show you how to multiply two-digit numbers.

a.
$$\begin{array}{r} 23 \\ \times 2 \\ \hline 6 \\ 40 \\ \hline 46 \end{array}$$
 Multiply the ones.
Multiply the tens.
Add the partial products. (279)

b.
$$\begin{array}{r} 26 \\ \times 2 \\ \hline 12 \\ 40 \\ \hline 52 \end{array}$$
 Multiply the ones. Change the form of 10 ones to 1 ten.
Multiply the tens.
Add the partial products. (281)

c.
$$\begin{array}{r} 52 \\ \times 3 \\ \hline 6 \\ 150 \\ \hline 156 \end{array}$$
 Multiply the ones.
Multiply the tens. Change the form of 10 tens to 1 hundred.
Add the partial products. (282)

d.
$$\begin{array}{r} 37 \\ \times 5 \\ \hline 35 \\ 150 \\ \hline 185 \end{array}$$
 Multiply the ones. Change the form of 30 ones to 3 tens.
Multiply the tens. Change the form of 10 tens to 1 hundred.
Add the partial products. (281-282)

3. Multiplying three-digit numbers

Multiply three-digit numbers as you multiply two-digit numbers.

$$\begin{array}{r} 232 \\ \times 3 \\ \hline 6 \\ 90 \\ 600 \\ \hline 696 \end{array}$$
 Multiply the ones.
Multiply the tens.
Multiply the hundreds.
Add the partial products. (285)

Numbers and Numerals

The Main Ideas

1. Meaning: cardinal You use number words and numerals to tell *how many*. (5, 6)

one, two, three or 1, 2, 3 tell
how many

2. Meaning: ordinal You use number words and numerals to tell *position* in an arrangement of groups, or sets. (7)



first



second

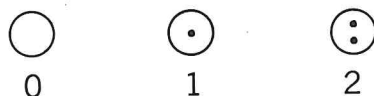


3rd



4th

3. Zero Zero tells *how many* when a set is empty. (8)



How to Use Numbers

1. Changing the name of a number
The name of a number may be changed. (9)

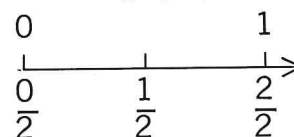
Ten ones equal 1 ten and 0 ones.

2. Place, or position, of a numeral
The place in which a numeral is

written tells what value it should be given. (10)

11 means 1 ten and 1 one.

3. Fractional numbers A fractional number is the number for a part of something. (258)



4. Fractions Fractions are used to name fractional numbers. (258)

one half $\frac{1}{2}$

three fourths $\frac{3}{4}$

Problem Solving

The Main Ideas

1. Story problems The question can be answered by doing something with the numbers. (22, 36, 40, 223, 242, 243)

2. Solving story problems
Change a story problem into the language of arithmetic. Then add, subtract, multiply, or divide. (22, 36, 40, 223, 242, 243)

How to Solve Story Problems

1. Addition If you are to find how many altogether, add. (22-23)

Mike had 6 marbles. He found 2. Then how many marbles did he have?

$$6 + 2 = \square \qquad 6 + 2 = 8$$

Mike then had 8 marbles.

2. Subtraction: remainder To find how many left, subtract the numbers of the groups, or sets. (36)

Susan had 5 cookies. She ate 2. How many cookies did she have left?

$$5 - 2 = \square \qquad 5 - 2 = 3$$

Susan had 3 cookies left.

3. Subtraction: comparison To find how many more or how many less the number of one group, or set, is than that of another, subtract the numbers of the groups, or sets. (40)

John had 3 pennies. Paul had 5. How many more pennies did Paul have than John?

$$5 - 3 = \square \qquad 5 - 3 = 2$$

Paul had 2 more pennies than John.

4. Multiplication If you are to find how many in all of the groups of equal size, multiply. (223)

Mary, Sue, and Paula each had 5 dolls. How many dolls did they have together?

$$3 \times 5 = \square \qquad 3 \times 5 = 15$$

The girls had 15 dolls together.

5. Division: how many in each group To find how many in each group of equal size, divide. (242)

Sam arranged 8 chairs in 2 rows of equal length. How many were in each row?

$$8 \div 2 = \square \qquad 8 \div 2 = 4$$

6. Division: how many groups If you are to find how many groups of equal size, divide. (243)

15 children went on a school trip. 5 children rode in each car. How many cars were used?

$$15 \div 5 = \square \qquad 15 \div 5 = 3$$

Subtraction

The Main Ideas

1. Meanings When you take a set apart to find how many are left, and when you compare the numbers of two sets to find by how many they differ, you subtract. (36, 40)

a. A set of 4 removed from a set of 5 leaves a set of 1.

$$5 - 4 = 1$$

b. A set of 5 compared with a set of 4 shows a difference of 1.

$$5 - 4 = 1$$

2. Words and signs A subtraction statement contains numerals and signs. (33, 34, 39)

$\begin{array}{c} 6 \\ \uparrow \\ \text{minuend} \end{array}$
 $\begin{array}{c} - \\ \uparrow \\ \text{minus} \end{array}$
 $\begin{array}{c} 2 \\ \uparrow \\ \text{subtrahend} \end{array}$
 $\begin{array}{c} = \\ \uparrow \\ \text{equal} \end{array}$
 $\begin{array}{c} 4 \\ \uparrow \\ \text{difference} \end{array}$

3. Zero in subtraction Any number minus itself equals 0. (46)

$$6 - 6 = 0$$

4. Checking Addition and subtraction are inverse operations. (131)

$$\begin{array}{r} 48 \\ -25 \\ \hline 23 \end{array} \qquad \begin{array}{r} 23 \\ +25 \\ \hline 48 \end{array}$$

How to Subtract

1. Subtracting one-digit numbers: basic combinations The examples below show you how to subtract using basic combinations. (34-38, 63-68)

$$\begin{array}{r} 9 \\ -5 \\ \hline 4 \end{array}$$

$$\begin{array}{r} 8 \\ -8 \\ \hline 0 \end{array}$$

$$\begin{array}{r} 14 \\ -5 \\ \hline 9 \end{array}$$

2. Subtracting one-digit numbers from two-digit numbers The examples below show you how.

a.
$$\begin{array}{r} 67 \\ -2 \\ \hline 65 \end{array}$$
 Subtract the ones and write the tens. (125)

b.
$$\begin{array}{r} 87 \\ -9 \\ \hline 78 \end{array}$$
 Change 1 ten to 10 ones and add them to the 7 ones. Subtract. Write the tens. (127)

3. Subtracting two-digit numbers The examples show how.

a.
$$\begin{array}{r} 87 \\ -24 \\ \hline 63 \end{array}$$
 Subtract the ones and subtract the tens. (129)

b.
$$\begin{array}{r} 42 \\ -27 \\ \hline 15 \end{array}$$
 Change the form of 1 ten to 10 ones. Remember 3 tens. Add the 10 ones to the 2 ones. Subtract the ones. Subtract the tens. (131, 132)

4. Subtracting from three- and four-digit numbers You can subtract from hundreds and thousands in the same way you subtract from ones and tens. (184, 200, 207, 210)

$\begin{array}{r} 362 \\ -48 \\ \hline 314 \end{array}$	$\begin{array}{r} 647 \\ -298 \\ \hline 349 \end{array}$	$\begin{array}{r} 8432 \\ -1796 \\ \hline 6636 \end{array}$
---	--	---

Tables of Measure

Use the tables of measure shown below for quick reference or for review.

Length

1 foot (ft.) = 12 inches (in.)
3 feet (ft.) = 36 inches
1 yard (yd.) = 3 feet

Weight

16 ounces (oz.) = 1 pound (lb.)

Money

5 pennies = 1 nickel
2 nickels = 1 dime
25 pennies = 1 quarter
2 quarters = 1 half dollar
100 pennies = 1 dollar
10 dimes = 1 dollar

Liquids

1 cup = $\frac{1}{2}$ pint (pt.)
2 cups = 1 pint
2 pints = 1 quart (qt.)
4 quarts (qt.) = 1 gallon (gal.)

Counting

12 things = 1 dozen (doz.)

Time

60 minutes (min.) = 1 hour (hr.)
24 hours (hr.) = 1 day
7 days = 1 week
52 weeks = 1 year
12 months = 1 year
365 days = 1 year

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